1997 INDEX

0.05-µm integrated circuits (ICs) **4**, 167
0.05-µm technology **4**, 157
0.13-µm VLSI CMOS technology, next generation **4**, 98
0.18-µm CMOS process technology **4**, 84
0.25-µm CMOS technology **4**, 84, 159
0.25-µm VLSI CMOS technology **4**, 97
0.35-µm CMOS technology **4**, 159
0.35-µm three-level metal technology **4**, 157
5ESS® Packet Switched Network with ATM Interconnect for CDMA **2**, 203-212
5ESS® switch **3**, 46, 48-49, 53, 55, 184, 186, 244 **4**, 140-142
5ESS® switch retrofit, technological requirements: 5ESS switch static data audit **1**, 69; base relation evolution conversion **1**, 70-71; office data consistency **1**, 67-68; office data conversion **1**, 69-70; structured language for data population constraints **1**, 68-69
5ESS® switch retrofit: architecture **1**, 71; conclusion **1**, 72; current process **1**, 66-67; desired process **1**, 67; introduction **1**, 65-66; migration **1**, 72; technological requirements **1**, 67-71
5ESS® switching system **1**, 97, 106, 108-110
5ESS®-2000 **1**, 144-153 **4**, 140-142
5ESS®-2000 Product Realization Center **1**, 65
5ESS®-2000 switch landline cellular option, code division multiple access (CDMA) (IS-95) **3**, 201-202
5ESS®-2000 switch software development environment, studying software faults: analyses of high-runner faults and faults found by phases **3**, 223-226; classification and distribution of faults **3**, 222-223; conclusions **3**, 231-232; introduction **3**, 221-222; finding low-level design faults earliest **3**, 226-231; general **3**, 221-232
800-MHz cellular bands **3**, 164-181

A

AAL *see* Asynchronous transfer mode (ATM) adaptation layer
AAL-2—A New ATM Adaptation Layer for Small Packet Encapsulation and Multiplexing **2**, 111-131
AC *see* Authentication center
ACA *see* Adaptive channel allocation
Access network domain **2**, 191-193
Accuracy of fixed-point approximation to HVP for single-rate traffic **2**, 73
ACDP *see* Actual customer demand plan
ACELP *see* Algebraic code excited linear prediction
ACF *see* Authentication control function
ACK *see* Acknowledgment packet
Acknowledgment packet (ACK) **3**, 160, 161
Acoustic echo control **2**, 11-13
Acoustic noise, reducing with active control **2**, 246-257
Active Control of Mechanical Vibrations **2**, 246-257
Active control, mechanical vibrations: applications **2**, 247-249; boring bar application **2**, 255-256; conclusion **2**, 256; introduction **2**, 246; overview of active control **2**, 246-247; problem-solving approach **2**, 249-251; technologies **2**, 251-255
Active state **3**, 139
Actively controlled boring bar **2**, 255
ActiveX* **1**, 158
Actual customer demand plan (ACDP) **1**, 201
Actuator technologies: actuators **2**, 251-253; controller hardware and software **2**, 253-254; sensors **2**, 254-255
AD *see* Adjunct
Adaptive channel allocation (ACA) **3**, 82
Adaptive differential pulse code modulation (ADPCM) **2**, 10
Adaptive Quantized Update Algorithm (AQUA) **2**, 56
Add/drop multiplexer (ADM) **2**, 215
Adjunct **3**, 74-75
ADM *see* Add/drop multiplexer
Admission control **2**, 45
ADPCM *see* Adaptive differential pulse code modulation
ADR *see* Application-dependent routing
ADSL *see* Asymmetric digital subscriber line and asynchronous digital subscriber line
Advanced Mobile Phone Service (AMPS) **3**, 83, 207-220
Advanced Mobile Phone System (AMPS) **3**, 164-167, 169-174
Advanced Mobile Phone System (AMPS) protocol **4**, 159
Advanced network services **3**, 64
Advanced Services Operations System (ASOS) **1**, 131, 143
Advanced Software Construction Center (ASCC) **1**, 140
Advanced Technology Systems, Lucent Technologies **2**, 246
Advances in Shared-Memory Designs for Gigabit ATM Switching **2**, 175-187
AFM *see* Atomic force microscopy
Agent selector **1**, 77
Ahuja, Sudhir R. **1**, 74-85 **2**, 5-14
Aide-de-Camp/Pro* system **1**, 159
Al-Cu *see* Alloys: aluminum-copper
Algebraic code excited linear predictive **3**, 214-215, 218
Algorithm of the mobile TCP (MTCP) **3**, 158
Alloys: aluminum-copper (Al-Cu) **2**, 239; aluminum-silicon (Al-Si) **2**, 239; aluminum-silicon-copper (Al-Si-Cu) **2**, 239
Alpha particles **4**, 26
Al-Si *see* Alloys: aluminum-silicon
Al-Si-Cu *see* Alloys: aluminum-silicon-copper
Alternative Methods for Introducing New Wireless Intelligent Network Services Using Triggers and Queries **3**, 20-29
Aluminum alloys, multilayering of **2**, 239
AMD 29K* architecture **1**, 5
American National Standards Institute (ANSI) **2**, 220, 221
American National Standards Institute (ANSI)-41 **3**, 59
American National Standards Institute (ANSI)-41-WIN **3**, 22, 25-26
AMPS *see* Advanced Mobile Phone Service and Advanced Mobile Phone System
Analysis of bandwidth efficiency **2**, 120: CDMA rate set 2 vocoder **2**, 121; computation of bandwidth efficiency **2**, 121; PDC half-rate vocoder **2**, 121; requirements on delay variation **2**, 121; results and discussion **2**, 122; traffic and models **2**, 120
Analyzing data collected from a designated experiment, S-wafers **1**, 120
Anderson, Jon **2**, 213-233
Andrus, J. **4**, 10
ANSI *see* American National Standards Institute
Antennas, flat panel array **4**, 156
API *see* Application programming interface
Apple Macintosh* **4**, 41-42
Apple's Newton* hand-held personal computer (PC) **4**, 158
Application access platform **3**, 190
Application areas, VFSM **1**, 110
Application contexts **3**, 76
Application programming interface (API) **1**, 213 **2**, 7
Application servers **1**, 50-51
Application signaling messages, approaches for carrying **2**, 127
Application-dependent route (ADR) server **1**, 49
Application-dependent routing (ADR) **1**, 58-62
Applications framework **3**, 187-191
Applications Test Satellite (ATS)-1 **3**, 6
Applications, H.320 **1**, 76
Application-specific integrated circuit (ASIC) **4**, 60
Application-specific integrated circuit (ASIC) design **4**, 106-107, 109, 117-119
Application-specific integrated circuit

(ASIC) technology, in shared-memory switch design **2**, 175-187
Approaches for carrying application signaling messages **2**, 127
Approaches to handoffs of mobile hosts: data interceptions **3**, 154; fast retransmissions **3**, 153; packet interceptions **3**, 156
AQUA *see* Adaptive Quantized Update Algorithm
Archer, Vance D. III **3**, 30-45
Architecture and Performance Analysis of Packet-Based Mobile Switching Center-to-Base Station Traffic Communications for TDMA **3**, 46-56
Architecture of the Dalí Main Memory Storage Manager, The **1**, 36-47
Archways **1**, 83
ARMIS *see* Automatic Recording Management Information System
ARPA *see* AT&T/Advanced Research Projects Agency
ASCC *see* Advanced Software Construction Center
ASCII **1**, 161, 163
ASIC *see* Application-specific integrated circuit
ASOS *see* Advanced Services Operations System
Asymmetric digital subscriber line (ADSL) **2**, 116
Asynchronous digital subscriber line (ADSL) **2**, 10
Asynchronous transfer mode (ATM) **1**, 140, 141 **2**, 3, 82-110, 132-150, 188-202, 203-212
Asynchronous transfer mode (ATM) **4**, 143
Asynchronous transfer mode (ATM) adaptation layer (AAL): application scenarios **2**, 114; introduction **2**, 111; type 2 (AAL-2) **2**, 111, 113
Asynchronous transfer mode (ATM) internetworking **2**, 82-110
Asynchronous transfer mode (ATM) local area network emulation (LANE) **2**, 133-136
Asynchronous transfer mode (ATM) network infrastructure **1**, 166, 168, 173-174, 177, 181, 183,184 **2**, 175-187 **3**, 99-102, 104, 106, 108-112, 114-116
Asynchronous transfer mode (ATM): evolution of the survivable SONET network **2**, 218; general **2**, 45, 46, 111, 214; infrastructure for wireless cellular systems and PCS access **2**, 115; operations, administration, and maintenance (OA&M), primer on **2**, 222; survivability architectures, standard classifications of **2**, 216
AT&T FastTrack **1**, 168
AT&T Global Information Solutions (GIS) **1**, 168
AT&T/Advanced Research Projects Agency (ARPA) **1**, 62
Atalla, M. M. **4**, 11, 20-21, 24
Atkins, David L. **1**, 19-35
ATLANTA Project **1**, 220
ATM *see* Asynchronous transfer mode and automated teller machine
Atomic force microscopy (AFM) **4**, 62
ATS-1 *see* Applications Test Satellite
Authentication center (AC) **3**, 76
Authentication control function **3**, 68
Automated teller machine (ATM) **1**, 98
Automatic Recording Management Information System (ARMIS) **1**, 144
AutoPACE **3**, 183
AutoPLAN® **1**, 138, 142
AUTOPLEX® Series II time division multiple access (TDMA) architecture with vocoder relocation to the switch **3**, 47-52
AUTOPLEX® System 1000 **3**, 82
AUTOPLEX® system **3**, 182-183
AUTOPLEX® time division multiple access (TDMA) architecture, current **3**, 47
AVP™ multimedia product: AVP-I **4**, 157; AVP-II **4**, 157; AVP-III single-chip multimedia processor **4**, 157

B

Baldwin, John H. **2**, 111-131
BALI: A Solution for High-Speed CDMA Data **3**, 134-151
Ball, Thomas **1**, 19-35
Bandwidth tradeoffs **3**, 143-145
Bandwidth, affordable **4**, 156
Baran, Thomas R. **1**, 19-35
Bardeen, John **4**, 4-6
Barshefsky, Alvin **3**, 221-232
Bartol Research Foundation, University of Delaware **3**, 12
Base station **3**, 76
BaseWorx™ platform **3**, 239
Basic call process **3**, 65-66
Basic call state model **3**, 66-67
Basic objects adapter (BOA) **1**, 210
BCP *see* Basic call process
BCSM *see* Basic call state model
Bell Labs Innovation Briefs **1**, 220-222 **2**, 258-259 **3**, 243-244 **4**, 169-170
BellMac-32A **4**, 54
Benedikt, Michael A. **1**, 19-35
Benefits of parallel connection control **1**, 58
Benning, Roger D. **2**, 246-257
Bent pipes (active mirrors) **3**, 6
BER *see* Bit error rate
Berger, Steve **4**, 61
Bergren, Mark H. **3**, 194-206
Bernstein, Lawrence **3**, 233-242
Best of Three Worlds—Building a Distributed Application as a Step Toward Business Objects, The **1**, 200-219
BEST-1 *see* Bipolar Enhanced super Self-aligned Technology
Betker, Michael R. **4**, 29-56
BGP *see* Border gateway protocol
Bharucha, Behram H. **2**, 111-131
Bi *see* Bipolar
Bielawski, William J. **2**, 203-212
Binary wafer map **1**, 117
Bipolar (Bi) **2**, 235
Bipolar Enhanced super Self-aligned Technology (BEST-1) **3**, 32
Bipolar junction transistor (BJT) **3**, 32
Bipolar transistor **4**, 76-79
B-ISDN *see* Broadband integrated services digital network
BISUP *see* Broadband ISDN User Part standards
Bit error rate (BER) **3**, 30
BJT *see* Bipolar junction transistor
Block codes **3**, 215
BOA *see* Basic objects adapter
Bodnar, Bohdan L. **3**, 46-56
Bohannon, Philip L. **1**, 36-47
Bolliger, Brian D. **3**, 194-206
Bond, W. L. **4**, 10
Bood, Jaap **1**, 65-73
Border gateway protocol (BGP) **2**, 51
Boring bar, actively controlled **2**, 255
Borst, Simon C. **3**, 81-98
Bosco, Harry L. **2**, 3-4
Boulin, David M. **3**, 30-45
Brattain, Walter **4**, 4-6, 11
Brinkman, William F. **4**, 57-75
Broadband integrated services digital network (B-ISDN): services **1**, 52; standard **2**, 175; User Part (BISUP) standards **1**, 53
Broadband networks, evolution toward **4**, 126
Broadband, enabling **4**, 143-148
Broker **1**, 76
Broker components **1**, 75
Brown, Philip E. **1**, 130-143
Brownlie, Robert A. **1**, 130-143
BS *see* Base station
Bubbles, atmospheric density **3**, 15
Budka, Kenneth C. **3**, 164-181
Built-in self-test (BIST) **4**, 113, 122
Burst access **3**, 143
Burst allocation: algorithm **3**, 147-148; procedures **3**, 146-148; service option **3**, 139
Burst control function **3**, 147
Burst scenario: forward link **3**, 140; reverse link **3**, 140
Burst synchronization **3**, 147
Buskens, Richard W. **2**, 151-174

C

C language **1**, 116, 162
C++ **1**, 162, 209
C++ **3**, 239, 240
CA *see* Certifying authority
CAD *see* Computer-aided design
Calculators **4**, 31, 33
Call centers **4**, 164
Call control: agent function **3**, 67; functions **1**, 48 **3**, 67; model **2**, 5, 7-8; procedures **3**, 139-140
Call engine **2**, 6, 8
Call flow **3**, 24-28
Call maintenance procedure **3**, 85

Call models **2**, 7-8 **3**, 69-73
Call monitoring and dropping **3**, 89
Call object **2**, 8
Call processing **3**, 23
Call servers **1**, 51
Call setup and handoff **3**, 90
Call unrelated service function **3**, 68, 75
Caller ID, personal encounters **4**, 163
Calling name display **3**, 25-27
Candide by Voltaire **3**, 237
Capability Maturity Model, Software Engineering Institute **3**, 221
Capability set 1 *see* IN capability set 1
Capability set 2 *see* IN capability set 2
Capacity **3**, 218-219
CASE *see* Computer-aided software engineering
CBR *see* Constant bit rate
CBT *see* Core-based trees
CBU *see* Customer business unit
CCAF *see* Call control agent function
CCF *see* Call control function
CDMA *see* Code division multiple access
CDP *see* Customer demand planning
CDPD *see* Cellular digital packet data
Celestri* **3**, 7
Cell phones: unbreakable **1**, 221; survival tests **1**, 222
Cell projection **4**, 61
Cell site **2**, 206
Cellular bands, 800-MHz **3**, 164-181
Cellular digital packet data (CDPD) networks: applications **3**, 177-180; architecture **3**, 164-168; channel hopping **3**, 171-173; circuit switched **3**, 168-169; future wireless data networks **3**, 180; protocol stack **3**, 169-171; tuning the reverse link medium access control (MAC) protocol **3**, 173-177
Cellular Digital Packet Data Networks **3**, 164-181
Center of Telematics and Information Technology (CTIT) **1**, 168
Centralized database **1**, 130
Certificate **1**, 10
Certifying authority (CA) **1**, 10
CES *see* Circuit emulation service
Channel **1**, 8
Channel assignment procedure **3**, 84
Channel coding **3**, 215-219
Channel segregation procedure **3**, 83
Channels **4**, 24
Channels: forward link **3**, 138; reverse link **3**, 138
Charge injection transistor (CHINT) **4**, 69
Chatter, regenerative **2**, 255-256
Chemical multilayering (CML) **2**, 235
Chemical vapor deposition (CVD) **4**, 17
Chen, Xiaoqiang **2**, 82-110, 132-150
CHINT *see* Charge injection transistor
Choice point **1**, 107
Christensen, H. **4**, 10
CID *see* Connection identification
CID *see* Critical address
Circuit emulation service (CES) **2**, 114
Circuit switching **2**, 3
Clarke, Arthur **3**, 5
Classical Internet protocol (IP) over asynchronous transfer mode (ATM) **2**, 84-86
Cleanup, Inferno™ **1**, 17
ClearCase CM* system **1**, 159
Clemens, James T. **4**, 76-102
Client-request basis **3**, 184
Client-subscription basis **3**, 184, 186
CME *see* Coronal mass ejection
CML *see* Chemical multilayering
CMOS see Complementary metal-oxide semiconductor
CMOS technology: 0.18-μm process **4**, 84, 90; 0.25-μm **4**, 84; standard VLSI design **4**, 108
Code division multiple access (CDMA) **2**, 116, 203-212 **3**, 134, 207
Code division multiple access (CDMA) Development Group **3**, 135
Code generation tools **1**, 103
Code introduction profile **1**, 146-147
Code size estimation **1**, 146-147
Coders: SX7300 **2**, 9; SX7300P **2**, 11, 13
Codes, block **3**, 215
Codes, convolution **3**, 215-216
Coding: channel **3**, 215-219; speech **3**, 214-215
COM *see* Component Object Model
Common Object Request Broker Architecture (CORBA) **1**, 76, 200-218
Common Object Request Broker Architecture (CORBA), definition **1**, 205
Common Object Request Broker Identifier **1**, 51
Common part sublayer (CPS) **2**, 119
Communication Middleware for Multi-Party Multimedia Applications **1**, 74-85
Communications and information services businesses, specialization **4**, 164
Communications software: "Connection Control in ATM Networks" **1**, 48; "On-Site Data Evolution for a 5ESS® Switch Retrofit" **1**, 65; "Communication Middleware for Multi-party Multimedia Applications" **1**, 74
Communications, computer to network **4**, 150-151
Communications, synchronous **1**, 16
CoMMware **1**, 74-85
Complementary metal-oxide semiconductor (CMOS) Si gate process technology **4**, 81-82
Complementary metal-oxide semiconductor (CMOS): general **4**, 57; modifications and possible alternatives **4**, 67; process technology evolution **4**, 72; technology **2**, 234
Complete partitioning (CP) **2**, 68
Complete sharing (CS) **2**, 68
Component Object Model (COM): architecture **1**, 200, 204; definition **1**, 205
Component-based development **1**, 158
Composite map **1**, 119
Compression **2**, 5, 8-11
Computation overhead **3**, 156
Computer-aided design (CAD) **4**, 58
Computer-aided design (CAD) tools **4**, 105, 108, 112-114, 116, 119
Computer-aided software engineering (CASE) **1**, 96
Computers in the home, role **4**, 151-152
Computer interfaces, human: gesturing **4**, 152; graphical displays **4**, 152; speech recognition **4**, 152
Computers, evolution **4**, 126
Computing and Communications, impact of solid-state electronics **4**, 126-154
Computing Environment for Spatial Data Analysis in the Microelectronics Industry, A **1**, 114-129
Computing Sciences Research Center, Bell Labs **1**, 5
Computing with wafer objects, S-wafers **1**, 126-127
Configuration and data display **3**, 188-189
Connection control **1**, 48
Connection Control in ATM Networks **1**, 48-64
Connection identification **2**, 113
Connection management algorithms **1**, 53-58
Connection servers **1**, 51
Connectivity costs, bulk Internet **4**, 156
Constant bit rate (CBR) **2**, 111
Context agent **1**, 77, 78
Context server **1**, 77, 78
Contexts **1**, 77
Continuus* system **1**, 159
Control models **1**, 50
Control-plane software **1**, 50
CONVERSANT® interactive voice information system **1**, 29
Convolution codes **3**, 215-216
Conway, Lynn **4**, 40
Coplien, James O. **1**, 166-187
CORBA *see* Common Object Request Broker Architecture
Core-based trees (CBT) **2**, 153
Coronal mass ejection (CME) **3**, 8
Correlation impedance **3**, 35
Coverage **3**, 218-219
Cox, Kenneth C. **1**, 19-35
CP *see* Complete partitioning
CPS *see* Common part sublayer
CRC *see* Cyclical redundancy check
Creating a process, Inferno™ **1**, 15
Critical address (CID) **2**, 117
Cryptography, public key **1**, 9
Crystal doping **4**, 86
CS *see* Complete sharing
CS-1 *see* IN capability set 1
CS-2 *see* IN capability set 2
CTIT *see* Center of Telematics and Information Technology
Culver-Lozo, Kathleen **1**, 130-143
Current Internet service model **2**, 44

Cu-SeeMe **2**, 46
CUSF *see* Call unrelated service function
Customer business unit (CBU) **1**, 201
Customer demand planning (CDP) **1**, 201
Customer premises domain **2**, 191-192
Cyclical redundancy check (CRC) **2**, 118
Czochralski technique **4**, 85

D

DAB *see* Digital audio broadcasting
Dalí main memory storage manager: architecture **1**, 37-40; collection and indexes **1**, 44-46; conclusion **1**, 46; Datablitz **1**, 37; fault tolerance **1**, 43-44; introduction **1**, 36-37; relational manager **1**, 46; transaction management **1**, 40-43
Dalí, Salvadore **1**, 36
Dalton, J. V. **4**, 21
Damping techniques, passive **2**, 246
DAMPS *see* Digital Advanced Mobile Phone Service
DARPA *see* Defense Advanced Research Project Agency
Data acquisition **2**, 13
Data analysis in the S-wafers environment **1**, 116
Data services **3**, 134
Data streams, continuous, multicasting of reliable: application **2**, 171-173; background **2**, 152-155; introduction **2**, 151-152; observed RMTP+ performance and deviations from theory **2**, 166-171; protocol implementation **2**, 164-166; reliable multicast transport protocol for continuous data streams **2**, 155-162; summary **2**, 173; theoretical performance analysis **2**, 162-164
Data Widgets* **1**, 208
Database storage layer **1**, 206
DataBlitz system **3**, 243
Datablitz, Dalí product **1**, 37
Datakit® virtual circuit switch **1**, 161 **4**, 129
DCA *see* Dynamic channel allocation
DCCH *see* Digital control channel
DCPA *see* Distributed call processing architecture
DCS *see* Digital cross-connect system
Deamon log **1**, 210
Deathnium **4**, 24
Decoder stage **2**, 9
Decoding files, Inferno™ **1**, 14
DECT *see* Digital European Cordless Telephone
Deep ultraviolet (DUV) **4**, 60
Deep ultraviolet (DUV) optical stepper **4**, 90
Defect formation mechanism **2**, 240
Defect type indication (DTI) **2**, 221
Defense Advanced Research Project Agency (DARPA) **2**, 246
DEFINITY® Enterprise Communications Server (ECS) **2**, 17
DEFINITY® telecommunications system **4**, 143
Delay **2**, 12
Department of Defense (DoD) **2**, 246
Deposition sequence: single-chamber cold/flow **2**, 239; single-chamber cold/hot **2**, 239; two-chamber cold/hot **2**, 239
Derick, L. **4**, 10
Design innovation, semiconductor **4**, 72
Design paradigm, VFSM **1**, 97
Design patterns, software, multimedia networking framework: application example **1**, 183-184; conclusions **1**, 184-185; future directions **1**, 185; introduction **1**, 166-167; MediaBuilder architecture **1**, 171-183; patterns **1**, 167-171
Design Tools for Requirements Engineering **1**, 86-95
Desktop computers **4**, 38-40
Detection points **3**, 69-74
Deutsche Telekom, Germany **1**, 168
Development of the Wireless Intelligent Network (WIN) and Its Relation to the International Intelligent Network Standards, The **3**, 57-80
Device modeling **3**, 39
Device Noise in Silicon RF Technologies **3**, 30-45
Dialed number trigger **3**, 24
dialing **3**, 91
DIBL *see* Drain-induced barrier lowering
diff and software reuse **3**, 238
Diffusion **4**, 15-19
Digital Advanced Mobile Phone Service (DAMPS) **3**, 207-220
Digital Advanced Mobile Phone Service (DAMPS)-1900 **3**, 207-220
Digital audio broadcasting (DAB) **2**, 259
Digital circuitry, in modern systems and services **4**, 155
Digital control channel (DCCH) **3**, 85
Digital cross-connect system (DCS) **2**, 130
Digital European Cordless Telephone (DECT) **3**, 85
DIRECT keyword **1**, 103
Direct satellite broadcasting **1**, 5
Direct sequence spread spectrum (DSSS): IEEE standard **3**, 121; product **3**, 118-133
Discrete event simulation **3**, 90
Disease, winning the struggle against **4**, 165-166
Dispatcher **1**, 78
Displaying the image, Inferno™ **1**, 16
Distance vector multicast routing protocol (DVMRP) **2**, 153-154, 156
Distributed call processing architecture (DCPA) **1**, 49-53
Distributed development **1**, 157
Distributed feedback quantum cascade lasers **2**, 258
Distributed functional plane **3**, 61-63, 66-73
Distributed system services **1**, 166
Distributed telephony **2**, 13
Dis™ **1**, 8
DLL *see* Dynamic link library
DNS *see* Domain Name Service and Domain Name System
DoD *see* Department of Defense
Domain Name Service (DNS) **2**, 47
Domain Name System (DNS) **2**, 44
Domains **1**, 54
Doping crystals **4**, 86
Dormant state **3**, 139
Dorward, Sean M. **1**, 5-18
Doshi, Bharat T. **2**, 111-131
Downlink **3**, 208
DPs *see* Detection points
Drain-induced barrier lowering (DIBL) **4**, 64, 67
DRAM *see* Dynamic random access memory
Dravida, Subrahmanyam **2**, 111-131
Driver stage **2**, 9
Dronamraju, S. Krishna **3**, 182-193
DSSS *see* Direct sequence spread spectrum
DTI *see* Defect type indication
DTMF *see* Dual-tone multifrequency signaling
Dual-tone multifrequency signaling (DTMF) **2**, 126
Dunlop, Alfred E. **4**, 103-125
DUV *see* Deep ultraviolet
DVMRP *see* Distance vector multicast routing protocol
Dynamic channel allocation (DCA) **3**, 82
Dynamic data **3**, 186
Dynamic link cost computation **2**, 53
Dynamic link library (DLL) **1**, 209
Dynamic random access memory (DRAM) **4**, 22-23, 26, 58
Dynamic range **3**, 30

E

E^2PROM *see* Electrically erasable programmable read-only memory
Earl, Deborah T. **3**, 194-206
Earth's proximate space environment **3**, 10
EBES *see* Electron beam exposure system
Echo **3**, 6
Echo cancellation **1**, 221 **2**, 6, 11-13
Echo canceller **2**, 12
Echo control **2**, 11-13
ECMS *see* Extended Change Management System
ECS *see* Enterprise Communications Server
EEPROM *see* Electrically erasable programmable read-only memory
EGP *see* Exterior gateway protocol
EIR *see* Equipment identity register
Ejzak, Richard P. **3**, 134-151
Electrically erasable programmable read-only memory (E^2PROM) **2**, 235
Electrically erasable programmable read-only memory (EEPROM) **4**, 69
Electromigration (EM) **4**, 71
Electron beam (e-beam) lithography **4**, 61

Electron beam exposure system (EBES) **4**, 89
Electronic links **4**, 161
Electronics, low power **4**, 148
Electrons and Holes in Semiconductors **4**, 7
Elemedia™ **2**, 5, 9, 11, 13
Elwalid, Anwar I. **2**, 15-35
EM see Electromigration
Embedded microprocessors **4**, 39
EMEA *see* Europe, Middle East, and Africa
Empirical Study of Software Faults Preventable at a Personal Level in a Very Large Software Development Environment, An **3**, 221-232
Enabling broadband **4**, 143-148
Enabling mobility **4**, 148-149
Encryption algorithms, Inferno™ **1**, 10
Eng, Kai Y. **2**, 175-187
Engine **1**, 78
Ensor, J. Robert **1**, 74-85
Enterprise Communications Server (ECS), DEFINITY® telecommunications system **2**, 17
Enterprise versus domain objects **1**, 216
Environmental effects on space-based assets: atmosphere water vapor effects **3**, 17; ionosphere effects **3**, 14; magnetic field effects **3**, 16; micrometeoroid and space debris effects **3**, 16; radiation effects **3**, 15; upper atmosphere effects **3**, 17
EPI *see* Epitaxial
Epitaxial (EPI) **3**, 32
Epitaxy **4**, 16-20
EPROM *see* Erasable programmable read-only memory
Equipment identity register **3**, 76
Equivalent capacitance **3**, 36-37
Equivalent noise conductance **3**, 35
Equivalent noise current **3**, 35
Equivalent resistance **3**, 36
Erasable programmable read-only memory (EPROM) **4**, 69
Erbium-doped fiber amplifier **3**, 243
Error, soft **4**, 26
Estimeeting **1**, 145
Ethernet connection **2**, 5, 46 **4**, 108
ETSI *see* European Telecommunications Standards Institute
Europe, Middle East, and Africa (EMEA) **1**, 201
European RACE program **1**, 168
European Telecommunications Standards Institute (ETSI) **2**, 232
EUV *see* Extreme ultraviolet
Evans, William J. **4**, 103-125
Event distribution **1**, 81
Event ordering and race conditions **1**, 82
Evolution of ATM Internetworking **2**, 82-110
EXCON (expand and concentrate) prototype board **2**, 184-185
Expansion factor, software **3**, 235
Explorer I satellite **3**, 5, 6
Exponential delays **3**, 154
Extended Change Management System (ECMS) **1**, 158, 162
Exterior gateway protocol (EGP) **2**, 51
Extreme ultraviolet (EUV) **4**, 62

F

FACCH *see* Fast associated control channel
Fading model **3**, 142-143
Failure mode analysis (FMA) **1**, 115
Fairchild Semiconductors **4**, 17-22, 24
Family-oriented Abstraction, Specification, and Translation (FAST), reengineering framework **1**, 190-193
Fast associated control channel **3**, 209
FAST *see* Family-oriented Abstraction, Specification, and Translation
Fault estimation **1**, 147-148
Fault-fixing profile **1**, 147-148
Faynberg, Igor **3**, 57-80
FCA *see* Fixed-channel allocation
FDD *see* Frequency division duplex
FE *see* Functional entities
Feature cooperation **3**, 64-65
Feature interaction **3**, 64-65
Feature interference **3**, 64-65
Featured files **1**, 162
Fernando, John S. **4**, 29-56
FHSS *see* Frequency hopping spread spectrum
Field-effect mechanism **4**, 4
FIFO *see* First in, first out
File transfer protocol (FTP) **2**, 43
Film-deposition sequence, layered tungsten **2**, 242
Final probe data **1**, 114
First in, first out (FIFO) **2**, 54
Fixed host **3**, 155
Fixed-channel allocation (FCA) **3**, 82
Fixed-point approximations **2**, 71
Flat panel array antennas **4**, 156
Floating zone: method **4**, 8; apparatus **4**, 9
Flora-Holmquist, Alan R. **1**, 96-113
FLX* **2**, 188
FMS *see* Failure mode analysis
FORTRAN **1**, 116, 127, 162
Forward link: burst scenario **3**, 140; channels **3**, 138; performance **3**, 141
Foundation of the Silicon Age, The **4**, 3-14
Frame **3**, 208
Frame formats **2**, 147
Frame relay protocol handler **2**, 208
Frame size **2**, 9
FrameMaker* **1**, 156
Framing **3**, 209-210
Frei, Michel R. **3**, 30-45
Frequency division duplex **3**, 6, 208
Frequency hopping spread spectrum (FHSS), IEEE standard **3**, 121-122
Freundlich, Glen G. **2**, 15-35
Frosch, C. J. **4**, 10
FTP *see* File transfer protocol
Fuller, C. S. **4**, 16
Functional entities **3**, 67-69
Fundamental code channel **3**, 137
Furchtgott, David G. **2**, 203-212
Future challenges **4**, 149-150
Future Internet service model **2**, 44
Future of internetworking **2**, 109
Future of Solid-State Electronics, The **4**, 57-75
Future silicon (Si) RF technologies **3**, 42

G

G.279A standard **2**, 10
G.723.1 standard **2**, 10
G.729 standard **2**, 10
Gabuzda, Lawrence R. **3**, 57-80
Gana, Akli **1**, 144-153
Garg, Vijay K. **3**, 207-220
Gated dielectric crosspoint **2**, 235
GDX *see* Gated dielectric crosspoint
General production fault **1**, 209
Generalized processor sharing (GPS) **2**, 55
Generator functions, S-wafers **1**, 124
Generics **1**, 159
GEO INTELSAT satellite network **3**, 15
GEO *see* Geosynchronous
Geosynchronous (GEO) **3**, 5
Gerhardt, Paul M. **2**, 15-35
Gibney, Bob **4**, 4
Gibson, Murray **4**, 61
Gigabit asynchronous transfer mode switch prototypes, advances in: early prototype and its generic architecture **2**, 179-181; expanding capacity to 160 Gb/s and beyond **2**, 184-185; flexible line card protection switching **2**, 183-184; performance boosting with additional fabric interface (FI) functions **2**, 182-183; size reduction and increased memory sharing **2**, 181-182; static and dynamic random access memories **2**, 185
Gigabit ATM switching, advances in shared-memory designs **2**, 175-187
Giga-scale integration (GSI) **2**, 234
Gitlin, Richard D. **2**, 3-4 **3**, 3-4
Glass village, living in a **4**, 162-163
Global functional plane **3**, 61-62, 65-66
Global positioning system (GPS): dispatching systems **4**, 164; technology **4**, 163
Global provisioning center (GPC) **1**, 201
Global service logic **3**, 66
Global state graph **1**, 108
Global System for Mobile Communications (GSM) **3**, 99-104, 106-112, 115-116, 134
Globalstar* **3**, 6
GlobeView®-2000 **1**, 131, 133, 140-142
GlobeView®-2000 ATM products in shared-memory switch design **2**, 175
GlobeView®-2000 ATM switch **1**, 168
Gompertz model **1**, 145
Gorton, W. S. **4**, 5
Government Solutions Business Unit, Lucent Technologies **2**, 246
GPC *see* Global provisioning center
GPS *see* Generalized processor sharing
GPS *see* Global positioning system
Grandhi, Sudheer A. **3**, 81-98
Graphical user interface (GUI) **1**, 214

Graphics toolkit, Tk **1**, 9
Grossmann, Dolores L. **3**, 194-206
GSI *see* Giga-scale integration
GSM *see* Global System for Mobile Communications
GUI *see* Graphical user interface

H

Haggan, Douglas E. **4**, 15-28
Hagirahim, Hassan **2**, 15-35
Half call model **2**, 8
Handoff algorithm **3**, 143
Hansen, Mark H. **1**, 114-129
Haynes, J. R. **4**, 5
HDT-EM *see* Host Digital Terminal-Element Manager
Header error check (HEC) **2**, 118
Heap tree **3**, 91
HEC *see* Header error check
Helmers, Patrick E. **1**, 188-199
Hewlett Packard products **4**, 158
HFC *see* Hybrid fiber-coax
Hierarchical virtual partitioning (HVP): fairness and robustness **2**, 75; general **2**, 68; optimality **2**, 77
Hierarchical Virtual Partitioning—Algorithms for Virtual Private Networking **2**, 68-81
High-speed data (HSD): definition **3**, 135; forward link performance **3**, 141; mobiles **3**, 150; reverse link performance **3**, 141-142
High-Speed Data Services Using the Switched Digital Broadband Access System **2**, 188-202
High-speed packet data service **3**, 139
HI-SCALE instrument **3**, 10
Hitless service survivability **2**, 216
Hlavacek, Donna M. **3**, 20-29
HLR *see* Home location register
Ho, Bin-wen **3**, 194-206
Hodgins, M. Garry **2**, 246-257
Hoerni, J. A. **4**, 11, 18-19, 21
Holzmann, Gerard J. **1**, 86-95
Home location register **3**, 21, 76
Host Digital Terminal-Element Manager **1**, 131
Hot carrier effects **3**, 43
HP/UX* **1**, 5
HSD *see* High-speed data
HTML *see* HyperText Markup Language
HTTP *see* Hypertext transfer protocol and HyperText Transmission Protocol
Huang, Steel T. **1**, 144-153 **3**, 221-232
Hubble telescope **3**, 17
Human interface **4**, 151-152
HVP *see* Hierarchical virtual partitioning
Hyatt, Gilbert **4**, 31
Hybrid fiber-coax (HFC) **2**, 116
HyperText Markup Language (HTML): general **1**, 19-34; MHTML **1**, 19
Hypertext transfer protocol (HTTP) **2**, 44
HyperText Transmission Protocol (HTTP) **1**, 20

I

IAF *see* Intelligent access function
IA-SPOX* **2**, 12
IB-DCA *see* Interference-based dynamic channel allocation
IC *see* Integrated circuit
ICore **1**, 131
ICS *see* Incoming call screening
IDL *see* Interface Definition Language
IDRP *see* Interdomain routing protocol
IEEE 802.11 standard: DSSS **3**, 121; DSSS vs. FHSS **3**, 122; FHSS **3**, 121-122; general **3**, 118-133
IETF *see* Internet Engineering Task Force
IGMP *see* Internet group management protocol
IGP *see* Interior gateway protocol
Impact of Solid-State Electronics on Computing and Communications, The **4**, 126-154
Implementation paradigm, VFSM **1**, 101
IMT-2000 *see* International Mobile Telecommunications-2000
IMTC *see* International Multimedia Teleconferencing Consortium
IN *see* Intelligent network
In situ processing **2**, 234
INAP *see* Intelligent Network Application Protocol
Incoming call screening **3**, 27, 64
Independence of applications **3**, 57
Industrial software design projects, design tools **1**, 86-95
Inferno™ Operating System, The **1**, 5-18
Inferno™ system: applications, internal environment of **1**, 8; environment **1**, 9
Information model **1**, 50
Information services and communications businesses, specialization **4**, 164
Integrated build management **1**, 158
Integrated circuit (IC) **2**, 234 **4**, 15-28, 57-75, 76-102
Integrated circuit (IC) design methodology: abstraction **4**, 114-117; analog design **4**, 117-118; design methods and CAD tools **4**, 114
Integrated circuit (IC) design, complexity: design automation **4**, 112-113; heuristics **4**, 113; leveraging complexity **4**, 113; Moore's Law **4**, 111; yield **4**, 111-112
Integrated circuit (IC) design, managing complexity in, introduction: background **4**, 104; design problem **4**, 104-105
Integrated circuit (IC) design, managing complexity in, past, present, and future **4**, 103-125
Integrated circuit (IC) design, managing complexity in: design complexity **4**, 111-113; conclusions **4**, 123; design methodology **4**, 113-123; first 40 years **4** 105-111; introduction **4**, 103-105; managing future design complexity 4, 118-123
Integrated circuit (IC) design, managing future complexity: design for test and characterization **4**, 121-122; design reuse and intellectual property **4**, 118-119; Internet **4**, 123; power and clock frequency **4**, 122-123; tools **4**, 119-121
Integrated circuit (IC) design, the first 40 years: search for products **4**, 105-108; standards **4**, 108; tools **4**, 108-111
Integrated circuit (IC) designers, major problems confronting **4**, 103-125
Integrated circuits (ICs), vanishingly small **4**, 167
Integrated private network–network interface (PNNI) **2**, 106-108
Integrated services digital network (ISDN) **1**, 74 **2**, 10, 116
Integrated services digital network (ISDN) customer premises equipment **3**, 75
Integrated services digital network (ISDN) primary rate interface (PRI), in MultiMedia Communications eXchange (MMCX) communications middleware **2**, 21
Integrated Web and Telephone Service Creation **1**, 19-35
Intel Corporation **4**, 105
Intel: 1103 memory circuit **4**, 80-81: 4004 microprocessor **4**, 80, 30-35; 8008 **4**, 30-31, 33-34; 8086 **4**, 38, 43-44; real-time operating environment **2**, 12
Intelligent access function (IAF) **3**, 68
Intelligent network (IN) capability set 1 **3**, 58
Intelligent network (IN) capability set 2 **3**, 58
Intelligent network (IN) Recommendations **3**, 60
Intelligent network **3**, 57-59
Intelligent Network Application Protocol (INAP) **1**, 111
Intelligent network services **3**, 24
Intelligent peripheral **3**, 74, 75
Interactive voice response (IVR) platforms **1**, 19-21, 30
Interconnected products **4**, 158
Interconnection, semiconductor **4**, 70
Interdomain routing protocol (IDRP) **2**, 51
Interface cards, shared-memory switch designs: synchronous digital hierarchy (SDH) **2**, 180; synchronous optical network (SONET) **2**, 180
Interface Definition Language (IDL) **1**, 203, 207
Interfaces, human, in computers: gesturing **4**, 152; graphical displays **4**, 152; speech recognition **4**, 152
Interfaces, Inferno™ **1**, 7
Interference-based dynamic channel allocation (IB-DCA) **3**, 82
Interim Standard *see* IS
Interior gateway protocol **2**, 51
International Mobile Telecommunications in the 2000-MHz WARC band **3**, 3

International Mobile Telecommunications-2000 **3**, 134-135
International Multimedia Teleconferencing Consortium **2**, 11
International Organization for Standardization *see* ISO
International Telecommunication Union (ITU) **2**, 10 **3**, 10
International Telecommunication Union (ITU) Recommendation H.323 **2** 15-34
International Telecommunication Union *see* ITU
International Telecommunication Union-Telecommunication Standardization Sector *see* ITU-T
Internet **1**, 5 **2**, 5
Internet Engineering Task Force **2**, 44
Internet group management protocol (IGMP) **2**, 153, 157
Internet network domain **2**, 191, 194
Internet protocol (IP) **2**, 22-23, 44, 151-153, 161, 163 **3**, 152, 164, 167, 169, 177
Internet protocol (IP) Multicast **2**, 89-93, 153
Internet protocol (IP) over asynchronous transfer mode (ATM) **2**, 84-86
Internet protocol (IP), in the MultiMedia Communications eXchange (MMCX) network **2**, 22-23
Internet traffic **2**, 46
Internet, bulk connectivity costs **4**, 156
Internet-based development **1**, 158
Internetworking **2**, 82-110
Introducing Software Reuse Technology **1**, 188-199
IP *see* Internet protocol
I-PNNI *see* Integrated private network–network interface
Irix* **1**, 5
IS-136 **3**, 82
IS-634, Revision A **3**, 137-138
IS-707 **3**, 137, 148
IS-95 **3**, 134-136, 138, 143, 147
ISDN CPE *see* Integrated services digital network customer premises equipment
ISDN *see* Integrated services digital network
ISO-9000 series standard **1**, 154
ITU **3**, 58, 99, 134
ITU Q.2931 broadband asynchronous transfer mode (ATM) protocol **1**, 177
ITU *see* International Telecommunication Union
ITU-T **2**, 113
ITU-T Recommendation H.320 **2**, 16
ITU-T Recommendation H.323 **2**, 15-16, 18-20
ITU-T Recommendation Z.120 **1**, 88, 90
IVR *see* Interactive voice response

J

Jacobson, Terry **3**, 57-80
James, David A. **1**, 114-129
Jansky, Karl G. **3**, 14
Jarvis, André W. **3**, 99-117
Java* **1**, 116, 158, 217
Jiang, Hong **3**, 164-181
Jitter **2**, 5-6, 8, 9
JND *see* Just noticeable difference
Joint Photographic Experts Group (JPEG) **1**, 11 **4**, 169
JPEG *see* Joint Photographic Experts Group
Just noticeable difference (JND) **4**, 169
Just-in-time concept, consumer services **4**, 163

K

Kahn, Colin L. **3**, 81-98
Kamerman, Ad **3**, 118-133
Kelly, Mervin **4**, 3, 17, 22, 27
Kernel, Inferno™ **1**, 8
Key Steps to the Integrated Circuit **4**, 15-28
KEYSTONE *see* Project management model generator
Khanna, Sanjeev **2**, 36-41
Khetarpal, Rakesh **3**, 182-193
Kilby, Jack S. **4**, 12, 19-21
Kirkendall effect **4**, 25
Kleimack, J. J. **4**, 10
Knisely, Douglas N. **3**, 134-151
Kriaras, Ioannis N. **3**, 99-117
Kruisbrink, J. Caspar **1**, 65-73
KS specifications **4**, 25-26
Kumar, Sarath **3**, 134-151
Kumaran, Krishnan **3**, 81-98

L

La Roche, Humberto J. **2**, 188-202
Ladd, David A. **1**, 19-35
Laha, Subhasis **3**, 134-151
LAN *see* Local area network
LANE *see* Local area network (LAN) emulation
Lanzerotti, Louis J. **3**, 5-19
Large-scale fading **3**, 87
Large-scale integration **4**, 20-21, 26
Laser intensity detection and ranging (LIDAR) **2**, 258
Lawrence Livermore National Laboratory **4**, 62
Layered architecture **1**, 60
Layered poly-Si for submicron CMOS **2**, 236
Layering Processes and Their Applications in Silicon Microelectronics **2**, 234-245
LBRM *see* Log-based reliable multicast
LCD *see* Loss of cell delineation
Lee, Anne Y. **3**, 46-56
Lee, C. A. **4**, 9
Length indicator **2**, 113
LEO *see* Low Earth orbit
LI *see* Length indicator
LIBRA: characteristics **2**, 60; conclusions and future work **2**, 62; implementation considerations **2**, 61; in boundary routers **2**, 61; model for performance and stability analysis **2**, 64; TOS-based adaptive routing with load sharing **2**, 55
LIBRA—An Integrated Framework for Type of Service-Based Adaptive Routing in the Internet and Intranets **2**, 42-67
LIDA *see* Load and interference based demand assignment
LIDAR *see* Laser intensity detection and ranging
Lied, Robert **1**, 188-199
Lilienfeld, J. E. **4**, 4
Limbo™ language **1**, 6, 11
Line attractors **1**, 220
Line cards, shared-memory switch designs: synchronous digital hierarchy (SDH) **2**, 180; synchronous optical network (SONET) **2**, 180
Line security, Inferno™ **1**, 10
Link budget **3**, 218-219
Linus AIX* **1**, 5
Lithography, improvements in device density and circuit speed **4**, 155
Lithography, integrated circuit (IC) **4**, 60
Lithography, tools: deep ultraviolet (DUV) optical stepper **4**, 90; electron beam exposure system (EBES) **4**, 89; projection printer **4**, 89; step and repeat **4**, 90; step and scan **4**, 90
Lithography: electron beam technology **4**, 98; extreme ultraviolet light **4**, 98; optical **4**, 98; unity printing mode **4**, 98
Little, J. B. **4**, 7
LLC *see* Logical link connection
LNA *see* Low-noise amplifier
LNNI *see* Local area network emulation network–network interface
LO *see* Local oscillator
Load and interference based demand assignment **3**, 137
Load sharing **2**, 54
Loar, H. H. **4**, 10
Local area network (LAN) **1**, 74, 156 **2**, 218
Local area network (LAN), ultra tiny **4**, 163
Local area network emulation (LANE) **2**, 132-150
Local area network emulation (LANE) logical components **2**, 93
Local area network emulation network–network interface (LNNI): general **2**, 133-136; layering **2**, 135; protocol stack **2**, 97-98, 135; topology **2**, 98
Local area network emulation user–network interface (LUNI) **2**, 133-136
Local oscillator (LO) **3**, 30
Location registration function **3**, 68-69
Location registration function state model **3**, 66-67
LOF *see* Loss of frequency
Log-based reliable multicast (LBRM) **2**, 154-155
Logical channels **3**, 209-210
Logical connection models, end-host-driven, network-value-added **1**, 59
Logical connection setup procedure **1**, 61-62

Logical connections **1**, 54
Logical link connection (LLC) **2**, 113
Longevity, human, issues of **4**, 165-166
LOP *see* Loss of power
LOS *see* Loss of signal
Loss of cell delineation (LCD) **2**, 221
Loss of frequency (LOF) **2**, 221
Loss of power (LOP) **2**, 221
Loss of signal (LOS) **2**, 221
Low Earth orbit (LEO) **3**, 5
Low-noise amplifier (LNA) **3**, 30
Low-power electronics **4**, 148
Low-pressure chemical vapor deposition (LPCVD) **2**, 236
LPCVD *see* Low-pressure chemical vapor deposition
LRF *see* Location registration function
LRFSM *see* Location registration function state model
LSPS *see* Lucent Speech Processing Solutions
Lu, Hui-Lan **3**, 57-80
Lubachevsky, Boris D. **3**, 81-98
Lucent Speech Processing Solutions (LSPS) **4**, 169-170
Lucent Technologies, recent patents **1**, 223-234 **2**, 260-268 **3**, 245-259 **4**, 171-184
Lucent Technologies' Microelectronics Group **4**, 130
LUNI *see* Local area network (LAN) emulation user-network interface

M

M4 language **1**, 162
MACA *see* Mobile-assisted channel assignment
Macintosh,* Apple **4**, 41-42
Maclennan, Carol G. **3**, 5-19
Magnetic torquing **3**, 16
Magnetopause **3**, 11
Magnetosphere **3**, 10
MAHO *see* Mobile-assisted handoff
Managing Complexity in IC Design—Past, Present, and Future **4**, 103-125
Manufacturing technology, microelectronics, present day **4**, 76, 84-97
Mapper code generation, VFSM **1**, 104
Mapping abstractions **1**, 106
Marconi **3**, 14
Markov Decision Theory **2**, 70
MARS *see* Multicast address resolution server
Martin, Robert L. **1**, 3-4
Martin, Samuel **3**, 30-45
MASI *see* Multimedia application/services interface
Masking, oxide **4**, 16-20
Mass storage: magnetic disk storage **4**, 135-136; optical storage **4**, 136-137
Massachusetts Institute of Technology (MIT) **2**, 43 **4**, 60
Master programmers **3**, 233
Mataga, Peter A. **1**, 19-35
Materials deposition technology: chemical vapor deposition (CVD) technique **4**, 90-91; physical vapor deposition (PVD) **4**, 90-91
Mawl application-oriented language: and application language engineering **1**, 22-28; and Web services **1**, 20; architecture and implementation **1**, 22-25
MBIC process *see* Modular BiCMOS process
MBONE *see* Multicast backBONE
MC *see* Message center
McIlroy, Doug **3**, 239
McSkimm, H. J. **4**, 5
Mead, Carver **4**, 40
Mean scattering time **3**, 43
Mechanical vibrations, active control of: active suspension **2**, 249; applications **2**, 247-249; boring bar application **2**, 255-256; conclusion **2**, 256; fan noise **2**, 248; introduction **2**, 246; lithography **2**, 248; machine tools **2**, 247-248; machinery vibrations **2**, 248; overview of active control **2**, 246-247; panel vibrations **2**, 248; problem-solving approach **2**, 249-251; technologies **2**, 251-255; telephony **2**, 248-249
MediaBuilder architecture from software design patterns: application engineering patterns **1**, 181-182; architectural overview **1**, 174-175; expanded architecture **1**, 182-183; multimedia realization patterns **1**, 180-181; purpose and services **1**, 171-174; session management patterns **1**, 175-180
MediaBuilder framework for networked multimedia applications **1**, 166-187
Medium earth orbit (MEO) **3**, 6
Melliar-Smith, C. Mark **4**, 15-28
Memory exhaustion **3**, 156
Memory, nonvolatile **4**, 70
MEO *see* Medium earth orbit
Merchant, Sailesh M. **2**, 234-245
Mesa transistor **4**, 16-18
Message center **3**, 76
Message sequence chart (MSC), requirements engineering design tool **1**, 88-90
Message sequence charts **1**, 107
Meta-HyperText Markup Language (MHTML) **1**, 19, 23
Metallization: aluminum **2**, 238; multilevel **2**, 238; tungsten **2**, 240
Metal-oxide semiconductor (MOS) **4**, 63
Metal-oxide semiconductor (MOS) IC technology, migration from junction bipolar IC technology **4**, 83
Metal-oxide semiconductor (MOS) technology **4**, 106
Metal-oxide semiconductor field-effect transistor (MOSFET) **3**, 32 **4**, 63
Method **1**, 123
MFG/PRO* **1**, 201
MHTML *see* Meta-HyperText Markup Language
Microcomputer **4**, 34-37
Microelectronics Group, Lucent Technologies **4**, 130, 159
Microelectronics power, million-fold increase in **4**, 155
Microphone arrays **2**, 13
Microprocessor **4**, 29-56
Microprocessor architecture, evolving: architectural extensions, promising **4**, 134; cache memory **4**, 131; datapath width **4**, 131; pipelining **4**, 132; superscalar **4**,132-134
Microprocessors, computers, and communications **4**, 128-130
Microprocessors, pipelined **4**, 132
Microsoft **1**, 156, 138, 142, 200
Microsoft Windows* for Workgroups, Version 3.11 **1**, 210
Middleware **1**, 74, 166
Middleware framework, MediaBuilder **1**, 166-187
Middleware, client/server (C/S) **1**, 200
Midha, Anil K. **1**, 154-165
Military specifications **4**, 25
Minimum noise figure **3**, 35
MIT *see* Massachusetts Institute of Technology
Mitra, Debasis **2**, 68-81
Mixed media calling **2**, 15-35
MMCX *see* MultiMedia Communications eXchange
Mobile computing environment **3**, 152
Mobile host **3**, 155
Mobile hosts, approaches to handoffs of: data interceptions **3**, 154; fast retransmissions **3**, 153; packet interceptions **3**, 156
Mobile IP **3**, 152
Mobile station **2**, 205 **3**, 76
Mobile support router (base station) **3**, 155
Mobile switching center (MSC) **2**, 127 **3**, 21, 76
Mobile switching center (MSC) product architectures, next generation **3**, 46-56
Mobile TCP (MTCP) **3**, 156, 160
Mobile telecommunications: second generation **3**, 99; third generation **3**, 99-117
Mobile-assisted channel assignment (MACA) **3**, 85
Mobile-assisted handoff (MAHO) **3**, 85
Mobility management **3**, 22-23
Mobility model **3**, 143
Mobility trigger **3**, 23, 27-28
Mobility types **3**, 135
Mobility, enabling **4**, 148-149
Model-based development **1**, 200
Modems **2**, 10
Modification request (MR) **1**, 159
Modular BiCMOS (MBIC) process and technology **3**, 32
Modularized protocols **1**, 51-52
Modulation **3**, 210-214
Module **1**, 8

MONET project *see* Multiwavelength Optical Networking project
Monitoring probe data, S-wafers **1**, 119
Monteban, Leo **3**, 118-133
Moore Plot **4**, 58
Moore, Bert **4**, 4
Moore, G. E. **4**, 11
Moore's Law **4**, 22-23, 82, 108, 111, 117, 165, 131
Morgan, Stanley **4**, 4
Morton, Edward **1**, 96-113
MOS *see* Metal-oxide semiconductor
MOSFET *see* Metal-oxide semiconductor field-effect transistor
MOSFET technology, high-speed **3**, 33
Motion Picture Experts Group (MPEG) **2**, 215 **4**, 169
Motorola 68000 **4**, 38
MP *see* Multilink protocol
MPEG *see* Motion Picture Experts Group
MPOA *see* Multiprotocol over asynchronous transfer mode
MR *see* Modification request
MS *see* Mobile station
MS* Word **1**, 156
MSC *see* Message sequence chart
MSC *see* Mobile switching center
MSS *see* Multimedia System Services
MSTP *see* Multiple spanning tree protocol
MTCP *see* Mobile TCP
Multicast address resolution server **2**, 90-92
Multicast backbone (MBONE) **2**, 46, 153
Multicast routers **2**, 153
Multicasting, reliable, of continuous data streams: application **2**, 171-173; background **2**, 152-155; introduction **2**, 151-152; observed RMTP+ performance and deviations from theory **2**, 166-171; protocol implementation **2**, 164-166; reliable multicast transport protocol for continuous data streams **2**, 155-162; summary **2**, 173; theoretical performance analysis **2**, 162-164
Multilayered poly-Si deposition **2**, 235
Multilink protocol (MP), in the MultiMedia Communications eXchange (MMCX) network **2**, 19, 23
Multimedia application/services interface (MASI) **2**, 17-18
MultiMedia Communications eXchange (MMCX) **1**, 83
MultiMedia Communications eXchange (MMCX) network: call mix model: **2**, 24-25; client/server architecture **2**, 15-19; conclusions **2**, 33-34; design tool **2**, 33; introduction **2**, 15-17; overview **2**, 17-23; performance analysis **2**, 25-33; performance requirements **2**, 23-24
Multimedia networking framework, from software design patterns: application example **1**, 183-184; conclusions **1**, 184-185; future directions **1**, 185; introduction **1**, 166-167; MediaBuilder architecture **1**, 171-183; patterns **1**, 167-171
Multimedia System Services (MSS) **1**, 76
Multi-platform support **1**, 157
Multiple spanning tree protocol (MSTP) **2**, 140-145
Multiple spanning tree: algorithm **2**, 146-147; general **2**, 140-147
Multiprotocol over ATM **2**, 99-103
Multiwavelength Optical Networking project (MONET) **2**, 259
Multi-way communications, Inferno™ **1**, 16
Murti, Krishna G. **2**, 5-14
Mwave* **2**, 12
Myers, Stephen L. **2**, 188-202

N

Name server **1**, 77
Nanda, Arun K. **2**, 234-245
Nanda, Sanjiv **2**, 111-131 **3**, 134-151, 261
NAP *see* Network access point
National Oceanic and Atmospheric Administration (NOAA) **3**, 9-10
National Science Foundation NETwork (NSFNET) **2**, 51
NCR **1**, 168
NCR 3455 receiver **2**, 166-167, 169
NE *see* network element
Negative cost of networking **4**, 158
Negative cost of quality **4**, 158
Net, blend of Internet, telecommunications, and broadcast entertainment **4**, 160
NetBSD **1**, 5
NetCare® professional and consulting services, Lucent Technologies **2**, 16
Netravali, Arun N. **4**, 126-154
Netscape Navigator* **1**, 137, 142
Network access point **3**, 73, 75
Network element (NE) **2**, 215
Network File System (NFS) **1**, 161
Network interface card (NIC) **2**, 191-192
Network management, VPG: administrative functions **2**, 226; defect detection and notification **2**, 226; general **2**, 226
Network news transfer protocol (NNTP) **2**, 44
Network reference model **3**, 137-138
Network services, advanced **3**, 64
Network stage **2**, 9
Network survivability techniques **2**, 213
Network Systems Division in the Netherlands, Lucent Technologies' **1**, 200
Networking **2**, 8-11
Networking, negative cost of **4**, 158
Networks, real home **4**, 158-160
Networks, tiny area **4**, 160
Neural computation **1**, 220
Newton, Curtis J. **2**, 213-233
Next Fifty Years: Some Likely Impacts of Solid-State Technology, The **4** 155-168
Next-generation mobile switching center (MSC) product architectures **3**, 46-56
NFS *see* Network File System
Ng, Kwok K. **3**, 30-45
NIC *see* Network interface card
nmake **1**, 158, 161-162
NMOS *see* N-type metal-oxide semiconductor
NMS/EMS server-client architecture **3**, 184-185
NNTP *see* Network news transfer protocol
NOAA *see* National Oceanic and Atmospheric Administration
Noh, Tai H. **2**, 213-233
Noise: flicker **3**, 33; measurements **3**, 36; radio frequency (RF) **3**, 35
Noncooperative networks **2**, 47
North American standard for analog cellular systems **3**, 93
Noyce, R. N. **4**, 11
Noyce, Robert **4**, 17, 19-20, 30
NSFNET *see* National Science Foundation NETwork
N-type metal-oxide semiconductor (NMOS) **4**, 65

O

O'Grady, James D. **1**, 96-113
OA&M *see* Operations, administration, and maintenance
OAM *see* Operations and maintenance
Object communication model (OCM) **1**, 50
Object Database Management Group 93 (ODMG-93) standards **1**, 215
Object linking and embedding (OLE) **1**, 204
Object linking and embedding custom control (OCX) **1**, 208
Object linking and embedding/component object model (OLE/COM) **1**, 76
Object Management Architecture (OMA) **1**, 203
Object Management Group **1**, 203
Object request broker (ORB), definition **1**, 205
Object request broker **1**, 203
Object request broker/Object-Oriented Database Management System (ORB/ODBMS) **1**, 205
Object-based computations in the S language **1**, 123
Object-oriented analysis (OOA) technique **1**, 49
Object-oriented programming (OOP) **3**, 241
Object-oriented technology (OOT) **3**, 239
ObjectStore* **1**, 206
OC *see* Optical carrier
OCM *see* Object communication model
OCX *see* Object linking and embedding custom control
ODBMS *see* ORB/Object-Oriented Database Management System
ODD *see* Office-dependent database
ODMG-93 *see* Object Database Management Group 93 standards

Odyssey* system **3**, 6
OFA *see* Output function array
Office-dependent database (ODD) **1**, 65-72
Offset field **2**, 120
Offset groups **2**, 121
Ohl, R. S. **4**, 5
OLE *see* Object linking and embedding
OLE/COM *see* Object linking and embedding/component object model
OMA *see* Object Management Architecture
OMG *see* Object Management Group
On-demand data **3**, 186
OneOS **1**, 131-132, 143
On-line shopping **4**, 161-162
On-Site Data Evolution for a 5ESS® Switch Retrofit **1**, 65-73
OOA *see* Object-oriented analysis technique
OOP see Object-oriented programming
OOSA *see* Orbix*+ObjectStore* Adapter 1.0
OOT *see* Object-oriented technology
Open shortest path first (OSPF) protocol **2**, 51
Operating System for Distributed Switching (OSDS) **1**, 106
Operating systems **4**, 126
Operation CRUSH **4**, 39-40
Operational data management and analysis **3**, 190-191
Operations and maintenance (OAM) **2**, 214
Operations, administration, and maintenance (OA&M) **2**, 115
Optical carrier (OC) **2**, 218
Optical fiber networks, large-scale **2**, 36-41
Optimum source impedance **3**, 35
ORB *see* Object request broker
Orbix* **1**, 210
Orbix* 1.35 C++ **1**, 207
Orbix*+ObjectStore* Adapter 1.0 (OOSA) **1**, 207-211
OrbixWeb* **1**, 217
Originating process **3**, 65
Origination trigger **3**, 34
OSDS see Operating System for Distributed Switching
OSF *see* Offset field
OSPF *see* Open shortest path first
Out-of-band communication **1**, 82
Output function array (OFA) **1**, 103
Overprovisioning the Internet **2**, 47
Overview of the MultiMedia Communications eXchange (MMCX) and Its Performance Characterization, An **2**, 15-35
Overview: Software **1**, 3-4; Packet Networking **2**, 3-4; Wireless **3**, 3-4
Oxide masking **4**, 10, 16-20

P

Packaging **4**, 25-26
Packet data network **2**, 5-14
Packet hashing table (PHT) **3**, 159
Packet networks: connectionless **2**, 3; connection-oriented **2**, 3
Packet processing connectivity option **3**, 148-150
Packet processing element synchronization **3**, 148
Packet retransmission **3**, 161
Packet switch unit **2**, 207
Packet switched network (PSN) **2**, 206-209
Packet switching unit (PSU) **1**, 111
Packet switching: advantages of **2**, 3; challenges of **2**, 3
Packet Telephony **2**, 5-14
Packet: GPS **2**, 55; handler (PH) **2**, 115; scheduling **2**, 45; scheduling, TOS-based **2**, 54
Packetphone architecture **2**, 6-7
Packetphones **2**, 5-14
PADRE program, Bell Labs **4**, 67
Palmpilot* personal digital assistant (PDA) **4**, 158
Pan-European Cordless Telephone **3**, 85
PAR *see* Private network–network interface augmented routing
Parallel and concurrent development **1**, 157
Parallel connection control (PCC) **1**, 48, 53, 62
Parallel connection control, in conjunction with ATM Form standards **1**, 57-58
Parsons, Mary Ann **1**, 65-73
Pascal **1**, 11
Pashan, Mark A. **2**, 175-187
Passive components, high quality **4**, 150
Patents, Lucent Technologies, recent **1**, 223-234 **2**, 260-268 **3**, 245-259 4, 171-184
Pattern modeling notation **1**, 172
Pattern-based approach, software **1**, 166-187
Paul, Sanjoy **2**, 151-174
Pautler, Lynn P. **1**, 188-199
Payload type indicator (PTI) **2**, 128
PC *see* Personal computer
PCC *see* Parallel connection control
PCM *see* Pulse code modulation
PCN *see* Personal communications network
PCS *see* Personal communications services and personal communications system
PDA see Personal digital assistant
PDC *see* Personal digital cellular
pdf *see* Probability density function
PDH *see* Plesiochronous digital hierarchy
Pearson, Gerald **4**, 4
Peled, Doron A. **1**, 86-95
Pentium* **2**, 13
Penzias, Arno A. **4**, 155-168
PEPCAP *see* Process capture
PEPGENVIS *see* Visualization generator
Performance impact on the Internet **3**, 154
Personal communications network **3**, 207-220
Personal communications services (PCS) **2**, 111, 203 **3**, 59, 194-196, 203, 207-220
Personal communications services (PCS)-1900 **3**, 207-220
Personal communications system (PCS) **3**, 3
Personal computers (PCs) in the 21st century **4**, 163
Personal digital assistant (PDA), Palmpilot* **4**, 158
Personal digital cellular (PDC) **2**, 120
Personal identification number (PIN) **1**, 98
Personal mobility services **3**, 64
Persyst **1**, 83
PGPS *see* Packet GPS
PH *see* Packet handler
Phillips, Vincent E. **3**, 99-117
Phone Markup Language (PML) **1**, 19-21, 28-31, 33
Photolithography **4**, 10, 16-20
PHT *see* Packet hashing table
Physical layer **3**, 138-139
Physical plane **3**, 62-63, 73-77
Physical vapor deposition (PVD) **2**, 239
PICs *see* Points in call
Pictures of graph algorithms (POGA), requirements engineering design tool **1**, 90-92
Pierce, John **3**, 5
Pike, Rob **1**, 5-18
PIM *see* Process information model and protocol independent multicasting
PIN *see* Personal identification number
Pinto, Mark R. **4**, 57-75
Pipelined microprocessors **4**, 132
Plain old telephone service (POTS) **1**, 6 **2**, 116
Plan 9™ system **1**, 5, 7
Planar process **4**, 17-20, 76, 84
Plasma etching in ICs **4**, 93
Plastic transistors **4**, 156
PLATform providing Integrated services to New Users of Multimedia *see* PLATINUM
Platforms: interactive voice response (IVR) **1**, 19-21, 30; MultiMedia Communications eXchange (MMCX) **2**, 15-35
PLATINUM project **1**, 166, 168
PLATO system **4**, 169-170
Plesiochronous digital hierarchy (PDH) **2**, 216
PML *see* Phone Markup Language
PMOS *see* P-type metal-oxide semiconductor
PMOSFET *see* Positive MOSFET
P-n junctions **4**, 4
PNNI *see* Private network–network interface
POGA *see* Pictures of graph algorithms
Points in call **3**, 69
Point-to-point protocol (PPP) **2**, 116
Point-to-point protocol (PPP), in the MultiMedia Communications eXchange (MMCX) network **2**, 19-20, 23

Polycrystalline silicon (poly-Si) **2**, 235
Polynomial time approximation algorithms, synchronous optical network (SONET) ring loading problem: approximation scheme **2**, 38-40; conclusion **2**, 40-41; introduction **2**, 36-37; preliminaries 37-38
Polynomial Time Approximation Scheme for the SONET Ring Loading Problem, A **2**, 36-41
Poly-Si *see* Polycrystalline silicon
Poly-Si *see* Polysilicon
Polysilicon (poly-Si) **3**, 32
Population Rule Language (PRL): general **1**, 68-71; version 5 (PRL5) **1**, 65, 68-71
Positive MOSFET (PMOSFET) **4**, 65
POTS *see* Plain old telephone service
Power efficiency, integrated circuit (IC) **4**, 60
PowerPC* architecture **1**, 5
PP *see* Provider plan
PPP *see* Point-to-point protocol
Presotto, David Leo **1**, 5-18
Primary ATM survivability requirements **2**, 219
Principal, ORB **1**, 214
Privacy issues, effects of technology **4**, 162
Private network–network interface (PNNI) **1**, 48
Private network–network interface (PNNI) augmented routing **2**, 104-106
Probability density function **3**, 143-144
Probability of coverage **3**, 150
Process capture **1**, 136-137
Process engineering **1**, 130-143
Process information model (PIM) **1**, 134-136
Program modules, collections of **1**, 77
Programmer skill **3**, 233
Project management model generator **1**, 138-140
Projection printer, lithography **4**, 89
Propagation **3**, 87
Propagation loss **3**, 142
Protection switching (PS) **2**, 217
Protection VPG (VPG_p) **2**, 221
Protocol handler for asynchronous transfer mode (ATM) **2**, 208
Protocol handler for voice **2**, 208
Protocol independent multicasting (PIM) **2**, 153
Protocol processing board (WILDcard), in the MultiMedia Communications eXchange (MMCX) network **2**, 20
Protocol, H-series **1**, 76
Protocols **3**, 76, 77
Protocols: core-based trees (CBT) **2**, 153; distance vector multicast routing protocol (DVMRP) **2**, 153-154, 156; integrated services digital network (ISDN) primary rate interface (PRI), in the MultiMedia Communications eXchange (MMCX) network **2** 21; Internet group management protocol (IGMP) **2**, 153, 157; Internet protocol (IP) **2**, 151-153, 161, 163 **3**, 164, 167, 169, 177; IP, in the MultiMedia Communications eXchange (MMCX) network **2**, 22; log-based reliable multicast (LBRM) **2**, 154; multilink protocol (MP), in the MultiMedia Communications eXchange (MMCX) network **2**, 19, 23; multimedia application/services interface (MASI) **2**, 17-18; point-to-point protocol (PPP), in the MultiMedia Communications eXchange (MMCX) network **2**, 19-20, 23; protocol independent multicasting (PIM) **2**, 153; reliable multicast protocol (RMP) **2**, 154; reliable multicast transport protocol (RMTP) **2**, 154; RMTP, a reliable multicast transport protocol for multicasting files in a wide area network (WAN) **2**, 151-174; RMTP+, a reliable multicast transport protocol for multicasting continuous data streams in a wide area network (WAN) **2**, 151-174; scalable reliable multicast (SRM) **2**, 154; simple network management protocol (SNMP), in the MultiMedia Communications eXchange (MMCX) network **2**, 21; transmission control protocol (TCP) **2**, 158, 161, 165, 169 **3**, 164, 177-178; transmission control protocol/Internet protocol (TCP/IP) **1**, 173, 183 **2**, 22-23, 183 **3**, 164, 169, 178; user datagram protocol (UDP) **2**, 22-23, 163, 165-166, 170-171
Provider plan (PP) **1**, 201
Proving in **3**, 241
Proving out **3**, 241
PS *see* Protection switching
Psion* hand-held personal computers (PCs) **4**, 158
PSN *see* Packet switched network
PSTN *see* Public switched telephone network
PSU *see* Packet switching unit
PTI *see* Payload type indicator
P-type metal-oxide semiconductor (PMOS) **4**, 65, 68
Public switched telephone network (PSTN) **2**, 10, 206-209
Public switched telephone network (PSTN) **2**, 111
Puchol, Carlos **1**, 19-35
Pulse code modulation (PCM) **2**, 9
Purple plague **4**, 25
PVD *see* Physical vapor deposition

Q

Q.931 signaling protocol **2**, 8
QoS *see* Quality of service
QPSK *see* Quaternary phase shift keying
Quality **4**, 20-27
Quality of service (QoS) **2**, 44, 68
Quality, negative cost of **4**, 158
Quaternary phase shift keying (QPSK) **3**, 30
Queries **3**, 20-29

R

RACE *see* Research in Advanced Communications Equipment and Research into Advanced Communication in Europe
RACF *see* Radio access control function
Radio access control function **3**, 68
Radio control function **3**, 69
Radio frequency (RF) **4**, 60
Radio frequency (RF) emissions **3**, 7
Radio Independent Broadband on Wireless (RAINBOW) **3**, 99-117
Radio port (RP) **2**, 115
Radio port multiplexer (RPM) **2**, 115
Radio terminal function **3**, 69
Radio, soft **4**, 159
RAINBOW *see* Radio Independent Broadband on Wireless
RAM *see* Random access memory
Ramakrishnan, K. G. **2**, 15-35
Ramming, J. Christopher **1**, 19-35
Random access memory (RAM) in shared-memory switch design **2**, 175-187
Random defect densities **1**, 119
Random numbers, Inferno™ **1**, 10
Rapid thermal annealing (RTA) **2**, 236
Rastogi, Rajeev R. **1**, 36-47
Rayleigh fading **3**, 30
RCF *see* Radio control function
RCS *see* Revision Control System
RDBMS *see* Relational Database Management System
Real space transfer **4**, 69
Real-time operating environment **2**, 12
Real-time protocol **2**, 45
Rebundling (cross connections) of LLCs **2**, 129
Recent Lucent Technologies Patents **1**, 223-234 **2**, 260-268 **3**, 245-259 **4**, 171-184
Redberg, Margaret H. **1**, 86-95
Reduced instruction set computer (RISC) **4**, 45-49, 122
Reduced instruction set computer (RISC) CPUs **4**, 47-49
Redundant events **3**, 92
Redundant states **3**, 91
Regenerative chatter **2**, 255-256
Rehor, Kenneth G. **1**, 19-35
Relational Database Management System (RDBMS) **1**, 212
Relational model **1**, 130
Relationship between native mode signaling and signaling over the ATM network **2**, 127
Reliability **4**, 20-27
Reliable multicast protocol (RMP) **2**, 154
Reliable Multicasting of Continuous Data Streams **2**, 151-174
Reliable multicasting, continuous data streams: application **2**, 171-173;

background **2**, 152-155; introduction **2**, 151-152; daemon **2**, 165-166, 168-171; observed RMTP+ performance and deviations from theory **2**, 166-171; protocol implementation **2**, 164-166; reliable multicast transport protocol for continuous data streams **2**, 155-162; RMTP+ daemon **2**, 165-166, 168-171; summary **2**, 173; theoretical performance analysis **2**, 162-164
Reliable Stream Transmission Protocols in Mobile Computing Environments **3**, 152-163
RELP *see* Residually excited linear predictive
Remote procedure calls (RPC) **1**, 211
Request for comments (RFC) **2**, 49
Requirements engineering, design tools: conclusion **1**, 93-94; introduction **1**, 86-87; message sequence chart (MSC) **1**, 88-90; pictures of graph algorithms (POGA) **1**, 90-92; set of **1**, 87-88; TEMPLE **1**, 92-93
Rerouting network (RRN) **2**, 217, 218
RES *see* Reserved
Research in Advanced Communications Equipment (RACE) **3**, 207
Research into Advanced Communication in Europe (RACE) **3**, 101, 103-104
Reserved (RES) **2**, 120
Residually excited linear predictive **3**, 215, 218
Resonant tunneling transistor (RTT) **4**, 69
Resource reservation protocol (RSVP) **2**, 3
Resource reservation protocol **2**, 45
Retrials and call blocking **3**, 87
Retrofit, 5ESS® switch: architecture **1**, 71; conclusion **1**, 72; current process **1**, 66-67; desired process **1**, 67; introduction **1**, 65-66; migration **1**, 72; technological requirements **1**, 67-71
Reverse link burst scenario **3**, 140
Reverse link channels **3**, 138
Reverse link performance **3**, 141-142
Revision Control System (RCS) **1**, 158
RF emissions *see* Radio frequency emissions
RF *see* Radio frequency
RFC *see* Request for comments
Richards, Derek J. **3**, 99-117
Rigge, Lawrence A. **4**, 103-125
RIP *see* Routing information protocol
RISC *see* Reduced instruction set computer
Ritchie, Dennis M. **1**, 5-18
RMP *see* Reliable multicast protocol
RMTP, a reliable multicast transport protocol for multicasting files in a wide area network (WAN) **2**, 151-174
RMTP+, a reliable multicast transport protocol for multicasting continuous data streams in a wide area network (WAN) **2**, 151-174
Robustness considerations in the design of the AAL-2: cell sequence number and parity **2**, 124; delineation recovery **2**, 123; delineation using the start field (STF) **2**, 124; loss of delineation **2**, 124; misconcatenation **2**, 124; performance and resiliency of the AAL-2 to physical (PHY)-layer transmission errors **2**, 125; resiliency of the AAL-2 to cell losses **2**, 125; self-delineation **2**, 123; transmission performance of the AAL-2 **2**, 125
Rodriguez-Moral, Antonio **2**, 42-67
Ross, Ian M. **4**, 3-14, 15-16
Routers, multicast **2**, 153
Routing of internetwork protocols over asynchronous transfer mode (ATM) **2**, 103-104
Routing over large clouds **2**, 86-89
Routing: information protocol **2**, 51; interior and exterior IP **2**, 51; Internet protocol (IP) **2**, 50; link-state TOS-based **2**, 52; link-state TOS-based adaptive **2**, 50, 54
Roy, Pradip K. **2**, 234-245
RP *see* Radio port
RPC *see* Remote procedure calls
RPM *see* Radio port multiplexer
RRN *see* Rerouting network
RS-232 connection **4**, 108
RSVP *see* Resource reservation protocol
RTA *see* Rapid thermal annealing
RTF *see* Radio terminal function
RTP *see* Real-time protocol
RTT *see* Resonant tunneling transistor
Runyon, James P. **2**, 188-202

S

S language **1**, 115, 116
S/N ratio *see* Signal-to-noise ratio
SABLIME® **1**, 158
SABLIME®/*nmake* systems **1**, 159
Saby, J. E. **4**, 8
Sagamore Hill **3**, 8
Sand, Donna M. **3**, 81-98
Sandia National Laboratory **4**, 62
SAP* **1**, 201
SBCS *see* Source and Binary Control System
Scalability **1**, 216
Scalable reliable multicast (SRM) **2**, 154
Scalpel™ (Scattering with Angular Limitation Projection Electron Lithography) **4**, 61
Scalpel™ tool **4**, 99
SCAMP *see* Switched capacitor amplifier
Scanning tunneling microscopy (STM) **4**, 62
SCCS *see* Source Code Control System
SCE *see* Service creation environment
SCEF *see* Service creation environment function
SCF *see* Service control function
SCM *see* Software configuration management
SCP *see* Service control point
SCUAF *see* Service control user agent function
SDBAS *see* Switched digital broadband access system
SDF *see* Service data function
SDH *see* Synchronous digital hierarchy
SDL *see* Specification and Description Language
SDP *see* Service data point
Security **3**, 187
Security issues, Inferno™ **1**, 9
Security mechanisms, Inferno™ **1**, 9
Selectivity **3**, 30
Self-healing network (SHN) **2**, 217
Self-healing techniques **2**, 13
SEMATECH **4**, 73
SEMATECH consortium **4**, 119
Semiconductor Industry Association (SIA) **4**, 66
Semiconductor Industry Association (SIA) National Technology Roadmap **4**, 111
Semiconductors, polysilicon **2**, 235
Sensitivity **3**, 30
Separation of switching functions **3**, 57
Sequence number (SN) **2**, 120
Servers **1**, 50
Service control **1**, 48
Service control function **3**, 67
Service control point (SCP) **1**, 49 **3**, 21, 23, 73-75
Service control user agent function **3**, 68
Service creation environment **3**, 21, 23, 68
Service creation, integrating Web and telephone: applications **1**, 31-32; introduction **1**, 19-21; Mawl and application language engineering **1**, 22-28; overview **1**, 22; related work **1**, 32-33; research activity, recent **1**, 33-34; summary **1**, 34; TelePortal architecture **1**, 28-31
Service data function **3**, 68, 75
Service data point **3**, 74, 75
Service independence **3**, 57
Service independent building blocks **3**, 59, 66
Service management function **3**, 68
Service management system **3**, 21, 23
Service measurement data **3**, 186
Service model for high-speed data **2**, 194-201
Service node **3**, 21, 74, 75
Service node/intelligent peripheral **3**, 23
Service plane **3**, 61-65
Service query **3**, 24
Service switching and control point **3**, 74, 75
Service switching function **3**, 67
Service switching point **3**, 23, 73, 75
Service triggers **3**, 23
Service-specific convergence sublayer (SSCS) **2**, 119
Session and resource manager **2**, 200-201
Session control **1**, 78
Session management **1**, 49
Sessions **1**, 77

SET *see* Single-electron transistor
Setup procedure, PCC **1**, 55-57
SFS *see* Sourcing and Forecasting System
Shadow fading **3**, 87
Shared-memory asynchronous transfer mode (ATM) switches for high-speed high-performance applications **2**, 175-187
Shared-memory designs for gigabit ATM switching, advances in: basics in shared-memory switch fabrics **2**, 176-179; introduction **2**, 175-176
Shared-memory switch fabrics, basics: hierarchical multiplexing **2**, 176-177; performance **2**, 178-179; RAM-based design **2**, 177-178
Shive, John **4**, 7, 11
SHLR *see* Standalone home location register
SHN *see* Self-healing network
Shockley, William **4**, 4-7, 17, 30
Shopping, on line **4**, 161-162
Short message **3**, 28
Short message entity **3**, 76
Short message service center **3**, 27-28
Si epitaxial growth **4**, 87
Si gate complementary metal-oxide semiconductor (CMOS) technology **4**, 81-82
Si *see* Silicon
SIA *see* Semiconductor Industry Association
SIBs *see* Service independent building blocks
Siddiqui, Muhammad A. **2**, 151-174
Signal transfer point **3**, 23
Signaling System 7 (SS7) **1**, 51 **3**, 22
Signal-to-noise (S/N) ratio **3**, 30
Signatures **1**, 120
Signet firewall **1**, 6
SiH_4 *see* Silane
Silane (SiH_4) **2**, 237
Silberschatz, Avi **1**, 36-47
Silicon (Si) **2**, 235-245
Silicon (Si) RF technologies **3**, 30
Silicon fabrication **4**, 103-125
Silicon Microelectronics Technology **4**, 76-102
Silicon superchip **4**, 150
Silicon vs. germanium **4**, 8
Silicon-on-insulator (SOI) **4**, 67
Simple mail transfer protocol (SMTP) **2**, 44
Simple network management protocol (SNMP) **2**, 49
Simple network management protocol (SNMP), in MultiMedia Communications eXchange (MMCX) **2**, 21
Simulator, VFSM **1**, 107
Single number reach **3**, 64
Single point of control **3**, 64
Single-electron transistor **4**, 69
Single-ended service feature **3**, 64
Skylab space station **3**, 17
Slalom 4.5 group **1**, 81
SLC®-2000 **2**, 188
Slice **1**, 14
Sliding windows **3**, 157
SM data *see* Service measurement data
SMAAL see Small packet multiplexed asynchronous transfer mode adaptation layer
SMAF *see* Service management agent function
Small packet multiplexed asynchronous transfer mode adaptation layer (SMAAL) **2**, 113
SMART *see* Systems Measurement Analysis and Reporting Tool
SMART—A Solution for Managing the Capacity, Growth, and Performance of Wireless Networks **3**, 182-193
SME *see* Short message entity
SMF *see* Service management function
SMS *see* Service management system
SMSC *see* Short message service center
SMTP *see* Simple mail transfer protocol
SN *see* Sequence number and service node
SN/IP *see* Service node/intelligent peripheral
Sneed, Elbert L. **3**, 207-220
SNMP *see* Simple network management protocol
Soft error **4**, 26
Soft radio **4**, 159
Software Capability Maturity Model **1**, 154
Software components, reusable: software for reuse **1**, 188; software with reuse **1**, 188
Software configuration management (SCM) **1**, 154-164
Software configuration management challenges in Lucent Technologies **1**, 157
Software Configuration Management for the 21st Century **1**, 154-165
Software configuration management system, criteria for choosing **1**, 163
Software configuration management systems in Lucent Technologies **1**, 158
Software design pattern architecture, MediaBuilder: application engineering patterns **1**, 181-182; architectural overview **1**, 174-175; expanded architecture **1**, 182-183; multimedia realization patterns **1**, 180-181; purpose and services **1**, 171-174; session management patterns **1**, 175-180
Software design patterns, from multimedia networking framework: application example **1**, 183-184; conclusions **1**, 184-185; future directions **1**, 185; introduction **1**, 166-167; MediaBuilder architecture **1**, 171-183; patterns **1**, 167-171
Software design patterns: building frameworks with **1**, 170-171; definition **1**, 167-169; form and notation **1**, 171; *Observer* pattern **1**, 169-170
Software development environment, very large, preventable software faults in **3**, 221-232
Software Engineering Institute Capability Maturity Model, **3**, 221
Software engineering: "Tools for Software Process Engineering" **1**, 130; "Statistical Modeling Applied to Managing Global 5ESS® -2000 Software Development" **1**, 144; "Software Configuration Management for the 21st Century" **1**, 154
Software evolution **4**, 137-138
Software Evolution and Reuse Consortium **1**, 188
Software Investment Strategy **3**, 233-242
Software platforms: interactive voice response (IVR) **1**, 19-21, 30; MultiMedia Communications eXchange (MMCX) **2**, 15-35
Software process engineering **1**, 130-143
Software Productivity Consortium **1**, 189
Software projection models **1**, 146-151
Software reliability model (SRM) **1**, 148-149
Software reuse technology, introducing: family-based design **1**, 189-190; Family-oriented Abstraction, Specification, and Translation (FAST), reengineering framework **1**, 190-193; introduction **1**, 188; lessons learned **1**, 198; reuse in industry **1**, 188-189; technology transfer problem **1**, 193-198
Software silos **1**, 202
Software surrogates **4**, 161
Software Technology Center (STC) **1**, 130-131, 140
Software Technology for Adaptable, Reliable Systems (STARS) **1**, 188
Software technology, progress **4**, 155
SOI see Silicon on insulator
Solar corona **3**, 7
Solar flares **3**, 7
Solar wind **3**, 7
Solaris* **1**, 5
Solar-terrestrial environment **3**, 7
Solid-state electronics, impact on computing and communications: computer to network communications **4**, 150-151; conclusion **4**, 152-153; enabling broadband **4**, 143-148; enabling mobility—a historical view of the mobility trend **4**, 148-149; evolving microprocessor architecture **4**, 130-134; future challenges **4**, 149-150; introduction **4**, 126-128; mass storage **4**, 134-137; microprocessors, computers, and communications **4**, 128-130; people interface and the role of computers in the home **4**, 151-152; software evolution **4**, 137-138; switching evolution summary **4**, 141-143; switching systems evolution **4**, 138-141
Solid-state technology, the next fifty years **4**, 155-168

Soloway, Gerald S. **2**, 188-202
Sommars, Steven E. **3**, 164-181
SONET *see* Synchronous optical network
Sound Blaster* **2**, 5, 8
Source and Binary Control System (SBCS) **1**, 161
Source Code Control System (SCCS) **1**, 158
Sourcing and Forecasting System (SFS) **1**, 202
Space shuttle **3**, 17
Space-based systems **3**, 6
Spacecraft: GOES 6 **3**, 13; IMP-8 **3**, 10; Ulysses **3**, 10; WIND **3**, 10
SPARC* 1000 sender **2**, 166-167, 169
SPARC* architecture **1**, 5, 207
Spatial data **1**, 114
Spears, David W. **2**, 188-202
SPECfp **4**, 49, 52
Specialized resource function **3**, 67-68
Specification and Description Language (SDL) **1**, 100
SPECint **4**, 49, 52
SPECmarks **4**, 49, 52
Spectron **2**, 12
Spectrum **3**, 86
Speech coding **3**, 214-215
Speech compression *see* Compression
SPOX* **2**, 12
Sputtering **2**, 239
SQC *see* Statistical quality control
SQL *see* Structured Query Language
SRF *see* Specialized resource function
SRM *see* Scalable reliable multicast
SRM *see* Software reliability model
SS7 *see* Signaling System 7
SSCP *see* Service switching and control point
SSCS *see* Service-specific convergence sublayer
SSF *see* Service switching function
SSP *see* Service switching point
Standalone home location register **3**, 21
Standards: G.279A **2**, 10; G.723.1 **2**, 10; G.729 **2**, 10
STARS *see* Software Technology for Adaptable, Reliable Systems
StarServer* FT machine **2**, 166, 169
Start field (STF), components of **2**, 119, 120
Start pointer (STP) **2**, 123
Staskauskas, Mark G, **1**, 96-113
State model **1**, 50
State, active **3**, 139
State, dormant **3**, 139
Statecharts **1**, 100
Statistical Modeling Applied to Managing Global 5ESS®-2000 Switch Software Development **1**, 144-153
Statistical quality control (SQC) **1**, 144-153
STC *see* Software Technology Center
Step and repeat lithographic tool **4**, 90
Step and scan lithographic tool **4**, 90
STF *see* Start field
STM *see* Scanning tunneling microscopy and synchronous transfer mode
STP *see* Signal transfer point
STP see Start pointer
Striegel, James J. **1**, 130-143
Stroustrup, Bjarne **3**, 239
Structured Query Language (SQL) **1**, 161, 208
STS protocol **1**, 10
STS *see* Synchronous transfer signal
Styx protocol **1**, 7
Subcode concatenation **3**, 138
Sudarshan, S. **1**, 36-47
Sunrise framework **3**, 243
Sunspots **3**, 7
Superchip, silicon **4**, 150
Supertrace algorithm **1**, 108
Supplemental code channels **3**, 137
Survivability scheme, three attributes of **2**, 215
S-wafers **1**, 114-128
S-wafers, basics of **1**, 116
Switch resource servers **1**, 51
Switch retrofit, 5ESS® switch: architecture **1**, 71; conclusion **1**, 72; current process **1**, 66-67; desired process **1**, 67; introduction **1**, 65-66; migration **1**, 72; technological requirements **1**, 67-71
Switched capacitor amplifier (SCAMP) **2**, 253
Switched digital broadband access system (SDBAS) **2**, 188-202
Switching evolution summary **4**, 141-143
Switching system evolution: digital switching **4**, 140; electromechanical systems **4**, 139; semiconductor penetration **4**, 139-140; subscriber line digital switching **4**, 140-141
SX7300 coder **2**, 9
SX7300P coder **2**, 11, 13
Synchronization **2**, 13
Synchronous digital hierarchy (SDH) **2**, 216
Synchronous digital hierarchy (SDH) for line cards **2**, 180
Synchronous optical network (SONET) **2**, 218, 222
Synchronous optical network (SONET) formatting, line cards **2**, 180
Synchronous optical network (SONET) ring loading problem, in polynomial time approximation algorithms: approximation scheme **2**, 38-40; conclusion **2**, 40-41; introduction **2**, 36-37; preliminaries **2**, 37-38
Synchronous transfer mode (STM) **2**, 113, 219
Synchronous transfer signal (STS) **2**, 218
System characteristics, SCM **1**, 155
System interfaces **3**, 186
System measurements and reporting **3**, 189-190
System software: "The Inferno™ Operating System" **1**, 5; "Integrated Web and Telephone Service Creation" **1**, 19; "The Architecture of the Dalí Main Memory Storage Manager" **1**, 36
Systems architecture, progress **4**, 155
Systems Measurement Analysis and Reporting Tool (SMART) software platform **3**, 186
Systems Measurement Analysis and Reporting Tool (SMART): design **3**, 183-186; general **3**, 182-193; platform **3**, 184-185

T

TA *see* Terminal adapter
TALISMAN network design software tool **2**, 258
Tantiprasut, Duke Thanes **2**, 82-110, 132-150
TCAP *see* Transaction capabilities application part
TCP *see* Transmission control protocol
TCP/IP **4**, 143
TCP/IP *see* Transmission control protocol/Internet protocol
TDMA for North American PCS Systems **3**, 207-220
TDMA *see* Time division multiple access
Teal, G. K. **4**, 7, 8
Technology transfer, VFSM **1**, 109
Technology transfer: adoption model **1**, 193-197; process **1**, 197-198
Technology, impact, overestimated **4**, 166-167
Technology, pace, underestimated **4**, 166-167
Telecommunications Industry Association **3**, 22, 59, 134, 207
Telecommunications Industry Association high-speed data **3**, 135
Telecommunications Industry Association/Electronic Industries Association (TIA/EIA)-41 standards **3**, 61
Telecommunications Information Network Architecture Consortium (TINA-C) **1**, 76
Teledesic* system **3**, 7
Telematics Research Center (TRC) **1**, 168
Telephone and Web service creation, integration: applications **1**, 31-32; introduction **1**, 19-21; Mawl and application language engineering **1**, 22-28; overview **1**, 22; related work **1**, 32-33; research activity, recent **1**, 33-34; summary **1**, 34; TelePortal architecture **1**, 28-31
Telephone company data network domain **2**, 191, 194
TelePortal software/hardware platform: and multiple browsers **1**, 20-21; architecture **1**, 28-31; general **1**, 19-21
Telstar I satellite **3**, 6
TEMPLE, requirements engineering design tool **1**, 92-93
Temporary local directory number **3**, 25
Terminal adapter (TA) **2**, 111
Terminal mobility services **3**, 64
Terminate and stay resident **2**, 12

Terminating process **3**, 65
Terminating trigger **3**, 24
Texas Instruments **4**, 18-20
Text-to-speech system (TTS) **4**, 169
The History of the Microprocessor **4**, 29-56
Theory-based software: "Design Tools for Requirements Engineering" **1**, 86; "The Virtual Finite-State Machine Design and Implementation Paradigm" **1**, 96; "A Computing Environment for Spatial Data Analysis in the Microelectronics Industry" **1**, 114
Thermal multilayering (TML) **2**, 235
Thermium **4**, 24
Theuerer, H. C. **4**, 8, 10
Third dimension **3**, 5
Third-Generation Mobile Network Architectures for the Universal Mobile Telecommunications System (UMTS) **3**, 99-117
Third-generation wireless systems, market **3**, 102-103
Thompson, Robin J. **3**, 194-206
Thomson, David J. **3**, 5-19
TIA *see* Telecommunications Industry Association
Tiers, CORBA **1**, 204
Time division multiple access (TDMA): digital techniques **3**, 81; environment **3**, 46-48, 51-55; for the personal communications network (PCN) **3**, 207; microcell/picocell architecture, future **3**, 52-53
Timeslots **3**, 208-212
TiN *see* Titanium nitride
TINA-C *see* Telecommunications Information Network Architecture Consortium
Tiny area networks **4**, 160
Titanium nitride (TiN) **2**, 238 **3**, 33
Tk, starting **1**, 15
TLDN *see* Temporary local directory number
TML *see* Thermal multilayering
TMS1000 **4**, 35
Token ring **2**, 46
Tools and technology, software **3**, 234
Tools for Software Process Engineering **1**, 130-143
Toolset, VFSM **1**, 96, 102
TOS *see* Type of service
Totem, a group communication system **2**, 154
TP *see* Transmission path
Traffic channel release **3**, 139
Traffic policing **2**, 45
Transaction capabilities application part (TCAP) **1**, 51
Transaction services **3**, 76
Transis, a group communication system **2**, 154
Transistor and CMOS limits **4**, 63
Transistor technology revolution, future: electrical parameter control **4**, 99; financial issues **4**, 99-100; gate dielectrics **4**, 99; introduction **4**, 97-98; lithography **4**, 98-99; metallization **4**, 99
Transistor technology revolution, past: bipolar ICs, early work on **4**, 76-77; IC yield and scaling theory **4**, 79-80; introduction **4**, 76; Si gate MOSFET transistor, invention **4**, 77-79; Si MOSFET technology, growth **4**, 80-83; VLSI, world of **4**, 83
Transistor technology revolution, present: device passivation **4**, 96-97; incorporating dopant into Si wafer **4**, 93-95; introduction **4**, 84; lithography **4**, 88-90; materials deposition technology **4**, 90-91; metallization technology **4**, 95-96; pattern transfers from photoresist material into device materials **4**, 92-93; planar process **4**, 84; present manufacturing facilities **4**, 97; Si crystal technology **4**, 84-87; silicon oxidation technology **4**, 87-88
Transistor technology revolution: past **4**, 76-84; present **4**, 84-97; future **4**, 97-100
Transistor transistor logic (TTL) circuits **4**, 106, 108
Transistor: alloy junction **4**, 8; diffused-base **4**, 10; germanium diffused **4**, 9; grown-junction **4**, 7; point-contact **4**, 5, 6
Transistors, plastic **4**, 156
Translator, VFSM **1**, 103
Transmission control protocol (TCP) **2**, 6-7, 43, 158, 161, 165, 169 **3**, 152, 164, 177-178
Transmission control protocol/Internet protocol (TCP/IP) **1**, 161,173, 183 **2**, 3, 22-23, 45, 183 **3**, 164, 169, 178 **4**, 143
Transmission path (TP) **2**, 221
Transport and switching domain **2**, 191, 193-194
Trickey, Howard W. **1**, 5-18
Triggers **3**, 20-29
Troutman, William W. **4**, 15-28
TrueWave® optical fiber **4**, 145
Tse, David **2**, 15-35
TTL see Transistor transistor logic
TTS system *see* Text-to-speech system
Tuckey, Curtis **1**, 19-35
Tungsten (W) **4**, 61
Tungsten: deposition, chemistry of **2**, 240; films, layered **2**, 242; silicide (WSi_x) **2**, 242
Twin tub technology **4**, 81-82
Type of service: general **2**, 49: packet tagging **2**, 49

U

UDP *see* User datagram protocol
Ultraviolet (UV) radiation **3**, 7
UML *see* Unified Modeling Language
UMTS *see* Universal Mobile Telecommunications System
UNI signaling standard *see* User-network interface signaling standard
Unicode **1**, 14
Unified Modeling Language (UML) **1**, 171-172
Universal Mobile Telecommunications System (UMTS) mobile network architectures: European research activities **3**, 103-112; general architectural issues **3**, 112-116; third-generation architectures **3**, 99-117
UNIX* environment **1**, 156
UNIX* operating system **1**, 5, 9, 102, 131, 142 **3**, 238
UNIX*-Solaris* **1**, 206
Uplink **3**, 208
User activity and mobility **3**, 86
User datagram protocol (UDP) **2**, 6-7
User datagram protocol (UDP): MultiMedia Communications eXchange (MMCX) network **2**, 22-23; reliable multicasting of continuous data streams **2**, 163, 165-166, 170-171
User to user (UU) **2**, 127
User-network interface (UNI) signaling standard **1**, 57
Using Design Patterns to Build a Framework for Multimedia Networking **1**, 166-187
UU *see* User to user
UV *see* Ultraviolet

V

V series modems **2**, 10
Validator, VFSM **1**, 108
Van Allen radiation belts **3**, 5
van den Broecke, Just A. **1**, 166-187
van Soest, Tim **1**, 200-219
Variable bit rate (VBR) **2**, 45
VBR see Variable bit rate
VCI *see* Virtual circuit identifier
VCOS® computer software **2**, 12
VE *see* Version editor
Vector sum excited linear predictive **3**, 214, 218
Veeraraghavan, Malathi **1**, 48-64
Verification tools, VFSM **1**, 105
Verkuil, René **1**, 200-219
Version editor (VE) **1**, 162
Very large scale integration (VLSI) technology **4**, 63, 67, 76, 82-85, 92-93, 96-100, 106, 108, 120, 136
Very large-scale integrated (VLSI) application-specific integrated circuits (ASICs) in shared-memory switch designs **2**, 175-187
VFSM *see* Virtual finite-state machine
VFSMvalid tool **3**, 244
Vibrations, mechanical, problem-solving approach: alternate actuation concepts **2**, 249; alternate control algorithms **2**, 249-251; design process **2**, 251
Vibrations, mechanical, reducing with active control **2**, 246-257
VIR *see* Virtual input register
Virtual circuit identifier (VCI) **2**, 118
Virtual communities **4**, 166

Virtual connections, ATM **2**, 220
Virtual corporations **4**, 165
Virtual device driver **2**, 12
Virtual finite-state machine (VFSM) **1**, 96 **3**, 244
Virtual Finite-State Machine Design and Implementation Paradigm, The **1**, 96-113
Virtual input register (VIR) **1**, 98
Virtual Meeting Minutes **1**, 83
Virtual Memory Mapping Architecture (VMMA) **1**, 212
Virtual names **1**, 109
Virtual partitioning (VP) **2**, 68
Virtual path (VP): alarm indication signal (VP-AIS) **2**, 222; ATM connections **2**, 214; connection (VPC) **2**, 118; cross connect (VPX) **2**, 215; group (VPG) **2**, 214, 221; signaling issues **2**, 126
Virtual Path Group Protection Switching—A Method for Fast ATM Network Survivability **2**, 213-233
Virtual path identifier (VPI) **2**, 118
Virtual path identifier/virtual channel identifier (VPI/VCI) **2**, 214
Virtual private network **3**, 64
Virtual private networking (VPN) **2**, 68
Virtual Socket Interface Alliance (VSIA) **4**, 119
Virtual topology management (VTM): algorithm **2**, 148; general **2**, 132-150; protocol **2**, 145-147
Virtual Topology Management Protocol for ATM LAN Emulation, A **2**, 132-150
Virtual transport **1**, 78
Visicalc **4**, 36
Visitor location register **3**, 24, 76
Visual Basic* **1**, 115, 206
Visualization generator **1**, 137-138
VLR *see* Visitor location register
VLSI *see* Very large scale integration
VMMA *see* Virtual Memory Mapping Architecture
Vocoder **2**, 120
Voice-controlled services **3**, 64
VP *see* Virtual partitioning and virtual path
VP-AIS *see* Virtual path alarm indication signal
VPC *see* Virtual path connection
VPG protection switching: 1+1 architecture **2**, 224; adding ATM-layer survivability to interoffice networks **2**, 232; detailed description of **2**, 223; hybrid SONET/ATM access rings **2**, 231; m:n architecture **2**, 225; network architectures **2**, 224; operation, **2**, 229; overview, an **2**, 220; sample applications **2**, 231
VPG *see* Virtual path group
VPI *see* Virtual path identifier
VPI/VCI *see* Virtual path identifier/virtual channel identifier
VPN see Virtual private networking
VPX *see* Virtual path cross connect
VSELP *see* Vector sum excited linear predictive
VSIA *see* Virtual Socket Interface Alliance
VTM *see* Virtual topology management

W

W *see* Tungsten
Wafer **1**, 114
Wafer data, S-wafers **1**, 127
Wafer map **1**, 116
Wafer objects, S-wafers **1**, 124
Waferized diagnostics **1**, 122
Wafer-specific computing, S-wafers **1**, 127
Wallace, Bob **4**, 9
WAN *see* Wide area network
WARC see World Administrative Radio Conference
Watermarked images **4**, 169
WaveLAN®-I system **3**, 118
WaveLAN®-II system: automatic rate fallback **3**, 132-133; distribution of functions **3**, 123-124; enhanced bit rates **3**, 122-123; general **3**, 118-133; IEEE 802.11 DSSS vs. Interim Standard (IS)-95 code division multiple access (CDMA) **3**, 121; power management **3**, 125-129; radio-frequency (RF) and digital signal processing (DSP) components **3**, 125; scalable system **3**, 129-132; single- and multi-channel roaming **3**, 124-125
WaveLAN®-II: A High-Performance Wireless LAN for the Unlicensed Band **3**, 118-133
Wavelength division multiplexing (WDM) **2**, 259
WDM *see* Wavelength division multiplexing
Web and telephone service creation, integration: applications **1**, 31-32; introduction **1**, 19-21; Mawl and application language engineering **1**, 22-28; overview **1**, 22; related work **1**, 32-33; research activity, recent **1**, 33-34; summary **1**, 34; TelePortal architecture **1**, 28-31
Web services **1**, 19-34
Western Electric **4**, 24-25
Whalen, Shaun P. **4**, 29-56
Wide area network (WAN) **1**, 156 **2**, 10, 114 **3**, 154
Wide area network (WAN) into local area network (LAN) device *see* WILDcard
WILDcard protocol processing board, in the MultiMedia Communications eXchange (MMCX) network **2**, 20
WIN *see* Wireless intelligent network
Windows NT* **1**, 5, 9, 204
Windows* **1**, 9, 142, 156, 204
Windows* 95 **1**, 5, 9
Windows* CE hand-held personal computers (PCs) **4**, 158
WinSock 2.0 **1**, 76
Winterbottom, Philip **1**, 5-18
Wireless and Wireline Convergence **3**, 194-206
Wireless at High Altitudes—Environmental Effects on Space-Based Assets **3**, 5-19
Wireless intelligent network **3**, 20-29, 57-80
Wireless Simulation and Self-Organizing Spectrum Management **3**, 81-98
Wireless systems, diversity **4**, 156
Wireless systems, third generation, market **3**, 102-103
Wireless/wireline service: architectural vision of service integration **3**, 197-201; economics of infrastructure integration **3**, 196-197; near-term product concepts for integration **3**, 201-204; regulatory changes, trends in the global marketplace **3**, 194-196
Working VPG (VPG_w) **2**, 221
World Administrative Radio Conference (WARC) **3**, 3

World Wide Web **1**, 6, 217 **2**, 46, 48 **4**, 138
WSi_x *see* Tungsten silicide

X

X Window System* **1**, 9, 161
X-ray proximity printing **4**, 60
X-ray technology **4**, 61
Xu, Kevin Houzhi **3**, 152-163

Y

Yager, W. A. **4**, 5
Yan, Ran-Hong **3**, 30-45
Yield **1**, 115
Yu, Weider D. **3**, 221-232

Z

Z80 **4**, 36-37
Ziedins, Ilze **2**, 68-81
Zipfel, George G., Jr. **2**, 246-257
Zurawski, Robert J. **3**, 20-29
Zysman, George I. **3**, 3-4